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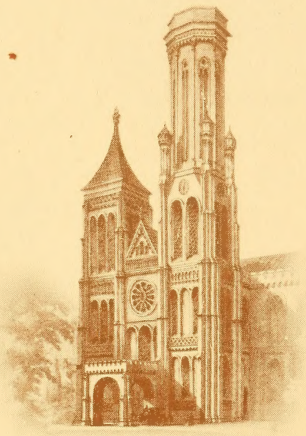

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CONTENTS

	Page
Map of Europe, in four colors ..... Size, 28 x 30 inches	
Channel Ports—And Some Others, by Florence Craig Albrecht	1
The Wonderland of California, by Herman Whitaker	57
American Game Birds, by Henry W. Henshaw	105
Nature's Transformation at Panama, by George Shiras, 3rd	159
The Warfare on Our Eastern Coast, by John Oliver La Gorce	195
Historic Islands and Shores of the Ægean Sea, by Ernest Lloyd Harris	231
London, by Florence Craig Albrecht	263
Greece of Today, by George Higgins Moses	295
Armenia and the Armenians, by Hester Donaldson Jenkins	329
Roumania, the Pivotal State, by James Howard Gore	360
The Beauties of France, by Arthur Stanley Riggs	391
The World's Debt to France	491
The Citizen Army of Switzerland	503
Jerusalem's Locust Plague, by John D. Whiting	511
Alaska's New Railway	567
The Nation's Pride, by Franklin K. Lane	589

INDEX FOR VOL. XXVIII (JULY-DECEMBER), 1915

(ENTRIES IN CAPITALS REFER TO ARTICLES)

"A"

Page

Adalia,
Beauties of ... 258
Dancing dervishes of ... 261
Harbor of, illus ... 257
Moreates of, illus ... 261
Silk industry of ... 261
Silk workers at, illus ... 260
Walls of, illus ... 259
Aintab,
Scenes in, illus ... 346, 347, 348
Alaska,
Coal field in, illus ... 581
Farm scenes in, illus ... 580, 582, 585, 588
Glacier belt in, illus ... 602
Garden, A, of, illus ... 584
Management of ... 599
Mining in, illus ... 587
Reindeer herd on lower Yukon, illus ... 586
Alaskan Engineering Commission,
Establishment of ... 568
Headquarters of ... 573
Personnel of ... 569
Reports made by ... 573
Work of ... 571
ALASKA'S NEW RAILWAY ... 567
Breaking ground for ... 567
Construction work,
Scenes of, illus ... 572, 574, 577, 579
Contractors for ... 583
Employees for ... 584
Equipment ... 578
Preliminary surveys for ... 571
Routes considered ... 571
Susitna route defined ... 573
Timber for ... 581
Way determined ... 573
Albrecht, Florence Craig,
Channel ports—and some others ... 1
London ... 263
American and foreign inventions compared ... 593
AMERICAN GAME BIRDS ... 105
Anaxagoras ... 233
Anderson, C. J ... 165
Angers, France ... 420
Ani, Ruins of,
Illus ... 331
Text ... 343
Animal breeding season,
In the north and in semi-tropics ... 179
Anthony, H. E ... 165, 168
Aosta, Italy, illus ... 439
Apollodurus,
Trajan's architect ... 361
Appledore, England, illus ... 33, 34, 35
Ararat, Mt., illus ... 328
Aristogoras of Miletus ... 231
Arles, France ... 438
Armenia,
American work in ... 357
Ancient capital of, illus ... 331
Bounds of ... 329
Church of ... 334
Civilization of ... 330
Folktypes, illus ... 332, 333, 335, 339, 342, 347, 355
Girls of,
Illus ... 340, 341
Text ... 337, 339, 341
Golden age of ... 345, 346, 348
Meaning of ... 329
Patriarchs of ... 347
Physical structure of ... 330
Products of ... 330
Size of ... 330
Towns and villages of ... 343
Turkish government of ... 347, 348
Vehicle, A, of, illus ... 332
Women of, illus ... 335, 340, 341, 344
ARMENIA AND THE ARMENIANS ... 329

Page

Armenians,
Allegiance of ... 329
Armenian question ... 350, 351, 353
Characteristics of ... 334
Grievances of ... 353
Historical appearance of ... 345
Language of ... 350
Mental quality of ... 337
Patriotism of ... 339
Persecution of ... 337, 339, 341
Russia's policy toward ... 356
Scenes from life of, illus ... 336, 338, 350, 351, 353, 354
Arras, France, illus ... 500
Asia Minor,
Archeological interest of ... 232
Athens, Greece,
Acropolis, View of, illus ... 296
Classic remains at,
Illus ... 300, 301, 302, 303, 305, 306, 309, 310, 311, 320, 321
Text ... 299, 303, 304, 305
Climate of ... 308
Dining in ... 313
"Hadrian's aqueduct" ... 307
Houses of ... 308
Modern aspects of ... 299
Royal palace at, illus ... 297
Social life in ... 308, 313, 315
Views in, illus ... 316, 317
University at, illus ... 298
Atherton, Gertrude ... 86
Austin, Mary ... 86
Auvergne ... 395, 465
Avalon harbor, illus ... 98
Avignon, France ... 434

"B"

Bakersfield, California,
Oil field, illus ... 62
Balance Rock, southern France, illus ... 475
Bardezag, Armenia ... 341, 343
Bass ... 73
Bats, Vampire ... 175
Bayeux tapestry ... 396
Beau Brummel's grave ... 398
Beaune, France ... 471
BEAUTIES OF FRANCE, THE ... 391
Bed, A Breton, illus ... 423
Birds, Game, American,
Avocet,
Described ... 147
Illustrated ... 128
Baldpate,
Described ... 110
Illustrated ... 111
Barrow's Golden-eye,
Described ... 114
Illustrated ... 115
Bob-white,
Described ... 141
Illustrated ... 140
Brant,
Described ... 120
Illustrated ... 121
Brant,
Black,
Described ... 120
Illustrated ... 121
Bufflehead,
Described ... 114
Illustrated ... 115
Canvasback,
Described ... 112
Illustrated ... 113
Clapper Rail,
Described ... 122
Illustrated ... 123

Page

Birds, Game, American,
- Coot,
  - Described 124
  - Illustrated 125
- Crane,
  - Sandhill,
    - Described 122
    - Illustrated 123
  - Whooping,
    - Described 122
    - Illustrated 123
- Curlew,
  - Eskimo,
    - Described 148
    - Illustrated 132
  - Hudsonian,
    - Described 148
    - Illustrated 132
  - Long-billed,
    - Described 133
    - Illustrated 132
- Dove,
  - Mourning,
    - Described 137
    - Illustrated 136
- Dowitcher,
  - Described 147
  - Illustrated 128
- Duck,
  - Baldpate,
    - Described 110
    - Illustrated 111
  - Barrow's Golden-eye,
    - Described 114
    - Illustrated 115
  - Black,
    - Described 108
    - Illustrated 109
  - Bufflehead,
    - Described 114
    - Illustrated 115
  - Eider, King,
    - Described 127
    - Illustrated 117
  - Eider, Pacific,
    - Described 116
    - Illustrated 117
  - Eider, Steller's,
    - Described 116
    - Illustrated 117
  - Eider, Spectacled,
    - Described 127
    - Illustrated 117
  - Fulvous Tree-duck,
    - Described 118
    - Illustrated 119
  - Gadwall,
    - Described 126
    - Illustrated 111
  - Golden-eye,
    - Described 114
    - Illustrated 115
  - Golden-eye, Barrow's,
    - Described 114
    - Illustrated 115
  - Greater Scaup,
    - Described 112
    - Illustrated 113
  - Harlequin,
    - Described 114
    - Illustrated 115
  - Labrador,
    - Described 116
    - Illustrated 117
  - Lesser Scaup,
    - Described 127
    - Illustrated 113
  - Mallard,
    - Described 108
    - Illustrated 109
  - Merganser, American,
    - Described 108
    - Illustrated 109
  - Merganser, Hooded,
    - Described 126
    - Illustrated 109
  - Merganser, Red-breasted,
    - Described 108
    - Illustrated 109

Page

Birds, Game, American,
- Duck,
  - Old Squaw,
    - Described 114
    - Illustrated 115
  - Pintail,
    - Described 112
    - Illustrated 113
  - Red-head,
    - Described 112
    - Illustrated 113
  - Ring-necked,
    - Described 127
    - Illustrated 113
  - Ruddy,
    - Described 118
    - Illustrated 119
  - Scaup, Greater,
    - Described 112
    - Illustrated 113
  - Scaup, Lesser,
    - Described 127
    - Illustrated 113
  - Scoter, American,
    - Described 146
    - Illustrated 117
  - Scoter, Surf,
    - Described 146
    - Illustrated 117
  - Scoter, White-winged,
    - Described 116
    - Illustrated 117
  - Shoveller,
    - Described 126
    - Illustrated 111
  - Teal, Blue-winged,
    - Described 110
    - Illustrated 111
  - Teal, Cinnamon,
    - Described 126
    - Illustrated 111
  - Teal, Green-winged,
    - Described 110
    - Illustrated 111
  - Widgeon, European,
    - Described 110
    - Illustrated 111
  - Wood,
    - Described 118
    - Illustrated 119
- Eider,
  - King,
    - Described 127
    - Illustrated 117
  - Pacific,
    - Described 116
    - Illustrated 117
  - Spectacled,
    - Described 127
    - Illustrated 117
  - Steller's,
    - Described 116
    - Illustrated 117
- Gadwall,
  - Described 126
  - Illustrated 111
- Gallinule,
  - Florida,
    - Described 124
    - Illustrated 125
  - Purple,
    - Described 124
    - Illustrated 125
- Godwit,
  - Hudsonian,
    - Described 133
    - Illustrated 132
  - Marbled,
    - Described 133
    - Illustrated 132
- Goose,
  - Blue,
    - Described 120
    - **Illustrated** 121
  - Brant,
    - Described 120
    - Illustrated 121
  - Brant, Black,
    - Described 146
    - **Illustrated** 121

Page

Birds, Game, American,
Goose,
Cackling,
Described ... 147
Illustrated ... 121
Canada,
Described ... 120
Illustrated ... 121
Emperor,
Described ... 147
Illustrated ... 121
Snow,
Described ... 146
Illustrated ... 121
White-fronted,
Described ... 118
Illustrated ... 119
Grouse,
Dusky,
Described ... 143
Illustrated ... 142
Franklin's,
Described ... 141
Illustrated ... 140
Ruffed,
Described ... 141
Illustrated ... 140
Sharp-tailed,
Described ... 143
Illustrated ... 142
Spruce,
Described ... 141
Illustrated ... 140
Heath-hen,
Described ... 143
Illustrated ... 142
Killdeer,
Described ... 137
Illustrated ... 136
Knot,
Described ... 129
Illustrated ... 128
Mallard,
Described ... 108
Illustrated ... 109
Merganser,
American,
Described ... 108
Illustrated ... 109
Hooded,
Described ... 126
Illustrated ... 109
Red-breasted,
Described ... 108
Illustrated ... 109
Pheasant,
Ring-necked,
Described ... 145
Illustrated ... 144
Pigeon,
Band-tailed,
Described ... 137
Illustrated ... 136
Passenger,
Described ... 137
Illustrated ... 136
Pintail,
Described ... 112
Illustrated ... 113
Plover,
Black-bellied,
Described ... 135
Illustrated ... 134
Golden,
Described ... 135
Illustrated ... 134
Upland,
Described ... 131
Illustrated ... 130
Prairie-chicken,
Described ... 143
Illustrated ... 142
Ptarmigan,
White-tailed,
Described ... 145
Illustrated ... 144
Willow,
Described ... 145
Illustrated ... 144

Page

Birds, Game, American,
Quail,
Bob-white,
Described ... 141
Illustrated ... 140
Chestnut-bellied scaled,
Described ... 139
Illustrated ... 138
Gambel's,
Described ... 139
Illustrated ... 138
Mearn's,
Described ... 141
Illustrated ... 140
Mountain,
Described ... 139
Illustrated ... 138
Scaled,
Described ... 139
Illustrated ... 138
Scaled Chestnut-bellied,
Described ... 139
Illustrated ... 138
Valley,
Described ... 139
Illustrated ... 138
Rail,
Clapper,
Described ... 122
Illustrated ... 123
King,
Described ... 122
Illustrated ... 123
Virginia,
Described ... 124
Illustrated ... 125
Redhead,
Described ... 112
Illustrated ... 113
Sage-hen,
Described ... 143
Illustrated ... 142
Sanderling,
Described ... 131
Illustrated ... 130
Sandpiper,
Pectoral,
Described ... 131
Illustrated ... 130
Spotted,
Described ... 131
Illustrated ... 130
Scoter,
American,
Described ... 146
Illustrated ... 117
Surf,
Described ... 146
Illustrated ... 117
White-winged,
Described ... 116
Illustrated ... 117
Shoveller,
Described ... 126
Illustrated ... 111
Snipe,
Wilson's,
Described ... 129
Illustrated ... 128
Sora,
Described ... 124
Illustrated ... 125
Stilt,
Black-necked,
Described ... 129
Illustrated ... 128
Swan,
Trumpeter,
Described ... 120
Illustrated ... 121
Teal,
Blue-winged,
Described ... 110
Illustrated ... 111
Cinnamon,
Described ... 126
Illustrated ... 111
Green-winged,
Described ... 110
Illustrated ... 111

Page

Birds, Game, American,
Turkey,
Wild,
Described ... 145
Illustrated ... 144
Turnstone,
Black,
Described ... 148
Illustrated ... 134
Ruddy,
Described ... 135
Illustrated ... 134
Widgeon,
European,
Described ... 110
Illustrated ... 111
Willet,
Described ... 133
Illustrated ... 132
Woodcock,
Described ... 129
Illustrated ... 128
Yellow-legs,
Greater,
Described ... 135
Illustrated ... 134
Lesser,
Described ... 148
Illustrated ... 134
Bismarck ... 365
Bitlis ... 343
"Black howler" ... 168
Blois, France ... 489
Boscastle, England,
Illus. ... 38, 39
Bourges, France ... 467
Brittany ... 395, 407
Brocket deer,
Illus. ... 173
Text ... 171
Bryce, James ... 330, 343
Bucharest, Roumania,
Scenes in,
Illus. ... 382, 383, 385, 386
Text ... 387
Bude, England,
Illus. ... 36
Burgundy ... 395, 471

"C"

Caen, France ... 398
CALIFORNIA, THE WONDERLAND OF ... 57
California,
Big trees of,
Illus. ... 69, 78, 79, 80, 81
Text ... 67
Bohemian life in ... 85, 86
Cactus chaparral in ... 57
Chinese of ... 86
Coast scenes in, illus ... 88, 91, 92, 97
Deer in ... 63
Destiny of ... 99
Early fame of ... 57
Fishing in ... 63, 73
Game of ... 73
Garden, A typical, of, illus ... 77
Kaweah Canyon, illus ... 72
Missions, Spanish, of ... 59
Philosophy of ... 85
Rainless regions of ... 57
Street life in ... 59
"The Old Spanish Trail" ... 59, 63
Writers of ... 86
Yucca in,
Illus. ... 65
Text ... 57
Cancole oyster beds, illus ... 412
Carcassone, France, illus ... 458, 459, 460, 461, 462
Carol, Prince,
Of Roumania ... 365
Castle of Angers, illus ... 436
Catalina Island, illus ... 98
Cathedrals:
England:
Ely Cathedral,
Illus. ... 562
Lichfield Cathedral,
Illus. ... 566
London, St. Paul's ... 267

Page

Cathedrals:
England:
Salisbury Cathedral,
Illus. ... 563
Winchester Cathedral, interior,
Illus. ... 565
France:
Amiens Cathedral,
Illus. ... 486, 488
Marseille Cathedral,
Illus. ... 477
Paris, Notre Dame,
Illus. ... 496, 498, 499
Perigueux, St. Front Cathedral,
Illus. ... 437
Rouen Cathedral,
Illus. ... 399
Italy:
Rome, St. Peter's,
Illus. ... 447
Cayuca ... 162
Chalgara, Armenia ... 343
Chambery, France ... 462
Champagne ... 395
CHANNEL PORTS—AND SOME OTHERS ... 1
Chartreuse, The Grande ... 462
Chateaux, French,
Illus. ... 492, 494, 495
Text ... 489
Chios:
Earthquakes at ... 237
Highway on, illus ... 236
History of ... 236
Landscapes in, illus ... 234, 235
Skeleton chamber of monastery at, illus ... 233
Struggles of ... 238
Windmills of ... 238
CITIZEN ARMY OF SWITZERLAND, THE ... 503
Clazomenæ ... 233
Clovelly, England,
Illus. ... 28, 29
Coastal changes:
Warfare between land and sea,
Advancing to attack, illus ... 223
Battleground, The, illus ... 225
Cape Henry around,
Illus. ... 196, 197
Text ... 195
Disputed French, A, illus ... 226
Dune forces ... 209
Enemy at work, illus ... 221
Forest outposts, illus ... 216
Islands of Chesapeake, at ... 200
Light cavalry of the ocean, illus ... 222
Man's part in ... 207, 211
New Jersey line, On the ... 207
Rear guards, The, illus ... 217
Record in the sands of ... 201
Running water, Power of ... 211
Sand army invading, illus ... 212
Sea-strength ... 209
Sentinels of the post, illus ... 220
Sheltered from sand foe, illus ... 215
Siege guns of the sea, The, illus ... 219
Standing sentinel, illus ... 199
Strategy of ... 195
Stronghold of land forces, illus ... 203
Truce, The, illus ... 218
War's lightning, illus ... 229
Wind attack, illus ... 228
Code Napoleon ... 496
Corfu, Harbor of, illus ... 315
Cornwall,
Ports of,
Illus. ... 6, 16, 17, 21, 26, 27
Text ... 5, 7, 8, 15, 18, 25, 31, 37
Village scenes in,
Illus. ... 4, 10, 13, 28, 29
Costa Rica ... 192

"D"

Dauphine ... 395, 460, 461
Delphi, Panoramic view of ... 325
Devil and Cornish pie, The ... 8, 15
"Devil's Teapot,"
Illus. ... 101
Devonport, England ... 37
Diarbekir ... 343
Dijon, France ... 473

Page
Dockyards of Portsmouth 55
Dolmen,
Illus. 414, 415
Text 418, 419
Dunes, The,
A traveling dune, illus 204
A tragic victory to, illus 210
Action of 209

"E"

Earth's respiration 211
Eastern coast, United States:
Beach scenes, illus. 199, 200, 202, 203, 212, 214, 216, 218, 222, 223, 225, 226
Cape Cod 201
Cape Henry, Virginia,
Text 195, 197
Illus. 196, 197
Chesapeake Bay 200
Heron Neck, Maine, illus 213
New Jersey 207
Rockaway Beach 201
Shackelford Bank, illus 198
Tilghman's Island 201
Edes, William C 568
Eiffel Tower, Paris 405
"El Capitan," illus 93
England,
Country life in, illus .. 556, 557, 558, 559, 560, 561
Cornwall coast of,
Illus. 2, 3, 6, 9, 14, 17
Text 1
Ely Cathedral in, illus 562
Folk-types of, illus 11, 13, 17, 19, 50, 554
Harbors of, illus 4, 6, 16, 17, 20, 21, 24, 26, 27, 33, 34, 35, 36, 38, 46
Lichfield Cathedral, illus 566
Salisbury Cathedral, illus 563
Winchester Cathedral, interior, illus 565
Women of, illus 11, 12, 14
Entre vaux, France 457
Erivan 343
Erzeroum 343
Escobal 166
Etchmiadzin,
"Armenian Vatican," The 330, 334
Etretat, France, illus 396
Eyes that shine at night 176

"F"

Festivals, Folk:
Armenian dance, An, illus 333
Circumcision procession, illus 549
Wedding, illus 367
Fleet street, London,
Illus. 275
Folk-types,
Armenian, illus 332, 333, 335, 339, 342, 352, 353, 355
Bulgarian, illus 390
English, illus 11, 13, 17, 19, 50, 554
Greek, illus 297, 300, 314
Italian, illus 448, 449
French, illus 392, 402, 403, 406, 413, 416, 417, 418, 419, 444, 446, 454
Kurdish, illus 347, 348
Roumanian, illus 362, 363, 364, 368, 371, 374, 375, 377, 379, 386, 388
Swiss, illus 440, 441, 450
Turkish, illus 346, 349, 357, 359
France,
Along the coasts of, illus 424, 425
An enormous hot-house 395
Architecture, Regional, in 393
Children of,
Illus. 393, 411, 418, 420, 432
Cities of, illus 397, 400, 405, 408, 409, 421, 422, 425, 430, 431, 436, 437, 485
Folk-types of, illus 392, 402, 403, 406, 413, 416, 417, 418, 419, 444, 446, 454
Geographical strength of 391
Hill-city of, illus 470
Literature of 497
Map of 471
Napoleon's leadership of 496
Perfume industry of 455
Provinces of 395
Page
France,
Reign of terror in 495
Revolution in 493
River system of 391
Rouen Cathedral, illus 399
Rural England in 395
Scenes in rural, illus 402, 404, 410, 429
Science in 501
Seaports of 392
Soldiers of, illus 406
Strongholds, Ancient, in, illus 456, 457
Women of,
Illus. 392, 403, 411, 417, 419, 421, 426, 428, 435, 444, 451, 468, 473

"G"

Game birds, American,
Abundance of 105, 106
Arctic breeding grounds for 106
Artificial propagation of 157
Decrease of 106, 107
Federal Migratory Bird Law for 153
Hunting for 107, 150
Index of 158
Money value of 150
Organizations for conservation of 157
Over bird preserves, illus 152, 154
Protection, Further, needed 155
Sale of 150
State protective laws for 151
Variety of 105
Gatun Lake,
Advantages of 159
Banks, Along the, of, illus 167, 170, 171, 193
Importance of 159
Shores, Unsurveyed, of 161
Size of 161
United States ownership of 182
Views upon, illus 162, 163, 194
Geyser, Giant, Yellowstone National Park,
Illus. 99
Glacier National Park,
Illus. 100
Inserts 104*b*, 104*c*
Goethals, Colonel 167, 569
Golden Gate, San Francisco, illus 56
Gore, James Howard,
Roumania, The Pivotal State 360
Grasse, France,
Illus. 472
Text 455
Greece,
Agriculture in 307
Capital, New, of 299
Feast days in 326
Folk-types of, illus 297, 300, 314
"Great idea" of 299
Hospitality in 318
Labor, Organization of, in 329
Language of 295
Racial traditions in 295
Royal family of 315
Soldiery of 323
Theology, Neglect of, in 323
Views in, illus 319, 322, 324, 325, 326, 327
Women of,
Illus. 312, 314
Text 320
GREECE OF TODAY 295
Greek curiosity 318
"Gregorian" Church 334
Grenoble, France,
Illus. 478, 479, 482
Text 461

"H"

Harris, Ernest Lloyd,
Historic islands and shores of the Ægean 231
Harte, Bret 76, 86
Henshaw, Henry W.,
Chief of the U. S. Biological Survey,
American Game Birds 105
Hetch-Hetchy Valley 67
Hidden Lake, Montana,
Illus., insert 104*b*
HISTORIC ISLANDS AND SHORES OF THE ÆGEAN 231
House-boat exploration 165

"I"

Page

Iguana,
The giant lizard prized in South as food, Illus. ... 191
Île de Cité, France ... 487
In the land of the Mamelukes, illus ... 442
Inventions,
American and foreign compared ... 593
Ireland,
"Darby and Joan of Galway," illus ... 551
Galway, A country road in, illus ... 552
Rural scene in, illus ... 555
Strand life in, illus ... 553
Isère River, illus ... 479, 480

"J"

Jenkins, Hester Donaldson,
Armenia and the Armenians ... 329
Jerusalem,
Locusts in ... 513
Street scene, Typical, in ... 546
"Tower of David" at,
Illus. ... 517
Text ... 525
Walls of, illus ... 515
JERUSALEM'S LOCUST PLAGUE ... 511
Joan I, Prince Alexandru ... 362
Joaquin Valley ... 63
Jordan River,
Scene on, illus ... 545

"K"

Kharput ... 343
Knik Arm, Alaska,
View over,
Illus. ... 570

"L"

La Gorce, John Oliver,
Associate Editor, The National Geographic Magazine,
The Warfare on Our Eastern Coast ... 195
Lands End ... 1
Illus. ... 2, 49
Lane, Franklin K ... 73
Secretary of the Interior,
The Nation's Pride ... 589
Languedoc ... 433
Laon, France,
Illus. ... 485
Text ... 487
La Purisima Concepcion ... 59
Le Havre, France ... 398
Lindos, Rhodes, illus ... 250, 251
Lipiany, M. de ... 159
Loches, France,
Illus. ... 484
Text ... 489
Locust plague (see "Jerusalem's Locust Plague")
Effects of, illus ... 520, 523, 525, 526, 534
Fighting the ... 535, 536
Havoc caused by ... 541
Markets emptied by ... 529
Occurrences, in Palestine, of ... 511
Views from, illus ... 527, 528, 531
Vines and trees suffer from ... 529
Locusts (see "Jerusalem's Locust Plague")
"Allah's armies" ... 535
A full-grown individual, illus ... 538
Cannibalism of ... 544
Charms against ... 548
"Creeping" ... 522
Collecting eggs of ... 521
Enemies of,
Illus. ... 514
Text ... 521
Folk-lore and the ... 547
Food value of ... 547
Homes invaded by ... 533
Larva of (magnified), illus ... 518
Migration of,
Illus. ... 512
Text ... 513
Moulting of ... 543
Propagation of ... 516
Proverbs about ... 548
Pupa state of, illus ... 536
Swarms of, illus ... 527, 528, 531, 532, 539, 540

Page

Locusts,
Trapping the,
Illus. ... 530, 531
Text ... 535
Locusts' eggs as food ... 513
LONDON ... 263
London ... 263
Bank of England at, illus ... 268
Complex of ... 263
Fire monument at, illus ... 264
House of Lords in, illus ... 291
Hyde Park in ... 289
Inns of court at ... 279
Parliament building in, illus ... 292, 293, 294
Romance of ... 265
St. Paul's at, illus ... 267
Size of ... 263
Street scenes in, illus ... 270, 271, 272, 273, 275, 279, 284
Tower of,
Illus. ... 262
Text ... 269, 271
Westminster group at ... 285
Whitehall in, illus ... 284
Wolsey's home in ... 285
Zoo at, illus ... 282, 283
London, Jack ... 86
Looe, England,
Illus. ... 50
Text ... 31
"Lorna Doone," The land of ... 18
Los Angeles ... 59

"M"

Maps showing,
Ægean Sea, Islands and shores of ... 232
Armenia, Ancient ... 359
Europe and surrounding areas affected by the war ... Insert, July, 1915
France, Provinces of ... 471
Locust plague area of 1914, Palestine ... 542
Panama before establishment of Canal Zone ... 180
Panama after establishment of Canal Zone ... 181
Rockaway Beach, Movement of ... 206
Marash,
Illus. ... 356
Text ... 343
Marazion, England ... 5
Mariposa Grove, illus ... 80
Market of Amiens, illus ... 490
Marriage mart, A ... 413
Matanuska coal fields ... 567, 589
Matanuska River,
View over, illus ... 569
Mayflower memories ... 37
Mears, Frederick, Lieut., U. S. Army ... 569
Meije, The, illus ... 481
Merced, The,
"River of Mercy" ... 67
Miller, Joaquin ... 76, 86, 99
Moldavia ... 362
Monkey, "Owl,"
Illus. ... 175
Text ... 171
Monterey coast, California, illus ... 71
Montpellier-le-Vieux, France ... 434
Mt. Rainier National Park, Washington,
Illus. ... 104, 104a
Mt. Shasta, illus ... 75, 95
Moses, George Higgins, formerly United States Minister to Greece,
Greece of Today ... 295
Muir, John ... 67

"N"

NATION'S PRIDE, THE ... 589
NATURE'S TRANSFORMATION AT PANAMA 159
Needles, The
At Southampton,
Illus. ... 55
Text ... 41
Nenana Canyon, illus ... 579
Nelson Monument,
Trafalgar Square, illus ... 278, 279
Nevers, France ... 466
Newlyn, England,
Illus. ... 16
Text ... 5

Page
Nice, France,
Illus. 476
Text 455
Nimes, France,
Illus. 464
Text 433
Normandy 395
Norris, Frank 63, 86

"O"

Oil field, American, illus. 62
Old Curiosity Shop, illus. 281
"Old Dr. Syntax," illus. 49
"Opening a gusher," illus 600
Orange, France,
Illus. 466, 467
Orne River 398

"P"

Paca (*Agouti paca virgata*),
Illus. 169
Text 179
Panama Canal Zone,
Animals of, illus. 169, 172, 173, 175, 178, 187, 189, 191
Bat caves on,
Illus. 184, 185, 186
Text 175, 176
Birds, Game, of 169
Changes, Great, upon 159, 161, 162
Chinese captain of industry on the 166
Enlargements, Necessity form of 191
Map of 181
Military strength of 183
Newly flooded forest in, illus. 160
Rodents of,
Text 168
Illus. 172
Sanitary aspects of 186, 187
Settlement in 182
Submerged jungles 162, 163
Trees of, illus. 164
Water supply for 159
Panama-Pacific Exposition,
Illus. 60, 61
Text 76, 86
Paris,
Church of the Madeleine at, illus. 394
Eiffel Tower at, illus. 405
Panthéon at, illus. 409
St. Etienne-du-Mont at, illus. 408
Pasteur, Our debt to 501
Petit Andely 407
Périgueux, France 429
Phocæa 233
Photography, Night 173, 174
Picardy 475
Pilchards 7
Plevna, Battle of 365
Plymouth, England,
Illus. 48
Text 37
Poitiers, France 427
Poitou 421, 427
Polycrates 243
Port Isaac, illus. 46
Portsmouth, England 41, 55
Pythagoras 243
Ptarmigan Lake,
Illus., insert 104*c*
Puget Sound,
Lumbering, illus 102

"R"

Rheims, France,
The Champagne City 475
Rhodes,
Climate of 257
Colossus of 256
Fortress at, illus. 243
History of 255, 256
Knights of 256
Population of 256
Rockaway Beach, Charts showing movement of 206
Scenes in, illus. 247, 248, 249, 252, 253, 254
St. Nicholas Tower at, illus. 242
Street of the Knights in, illus. 246
Walls of, illus. 244, 245

Page
Riggs, Jr., Thomas 569
Riggs, Arthur Stanley,
The Beauties of France 391
Riviera,
Royat, France,
A highland spa,
Text 465
Illus. 483
Roosevelt, Theodore 192, 193
Rouen, France,
Illus. 399, 400
Text 398, 401
Roumania,
Agriculture of 369
American corn in 370
Antiquarian interest in 360
Children of 363, 371
Climate of 373
Construction of 362
Costumes in 369
Courts of 381
Customs in 375
Economic condition of 376
Folk-types in, illus. 362, 363, 364, 368, 371, 374, 375, 377, 379, 386, 388
Food of 369
Goths and Huns invade 361
Jews of 384
Land ownership in 366
Languages in 376
Legislators for 379
Military service in 378
Peasants of 384
Railways of 383
Religious life of 384
Rome's connection with 360, 361
Salt deposits of 382
Scenes in, illus. 361, 364, 366, 371, 372
Size of 365
Soldiers of, illus. 381, 386
Superstitions in 373, 375
Trade routes of 382
Women of,
Illus. 362, 368, 370, 374, 378
Text 369
ROUMANIA, THE PIVOTAL STATE 360

"S"

Salmon 73
Samos,
Cities of 245
History of 243
Industries of 255
Street scene in, illus. 237
Temple of Hera, Ruins of, at,
Illus. 239
Text 245
Windmills of, illus. 240, 241
San Fernando Mission,
Illus. 90
San Francisco,
Panorama of, illus. 58
Text 76, 80, 81, 85, 86
San Francisco's trade 80
San Gabriel Mission 59
San Jose, California,
Palmdale Mission, illus. 70
Savoyards, The 463
Scillys, The 1
Scillys islands 1
Sequoia gigantea,
Illus. 79
Text 67, 73
Seward, Alaska,
Terminal of U. S. government railway, illus. .. 568
Shiras, 3rd, George,
Nature's Transformation at Panama 159
Sierras,
Illus. 66, 94
Text 63
Sisteron, France 457
Socrates, Prison of, illus. 311
Southampton, England,
Illus. 55
Text 41
Spokane River, Washington,
Illus. 101, 103
St. Honorat, France,
Illus. 453

Page

St. Lo, France, illus. 397
St. Ives, England. 31
St. Malo, France. 407
St. Michel, Fortress-abbey of,
Illus. 430, 431, 452
Text 407
Stoddard, Charles Warren. 86
Susitna route. 573
Swiss army,
Democracy of. 505
Drill of. 506
Enlistment terms in. 504
Mobilization of. 503
Organization of. 503
Size of. 503
Target practice of. 507
Switzerland,
Rural scenes in, illus. 440, 441, 445, 509
Soldiers of, illus. 502, 504, 505, 506, 510
Tell Memorial in, illus. 508

"T"

Tahoe, Lake,
Illus. 64
Text 73
Tarsus 343
Teos 239
Termite's nest, illus. 166
Thames River, illus. 266, 267
Theseum, Athens, illus. 306
Tigani, Rhodes. 245
Tintagel, England, illus. 40, 42, 43, 44, 45
Toyo Kisen Kaisha. 80
Toulouse 433
Touraine 395, 489
Trajan's column. 361
Trafalgar Square, London,
Illus. 278
Tree memory. 73
Trinidad River. 163
Trout, Rainbow. 73
Tuolumne Grove, California, illus. 79

"U"

United States, The
Beauty spots of. 602
Development program for. 595
Education, Foremost industry of. 603
Gifts of. 594, 595
Independence of. 590, 591
Minerals of. 590, 591
Mission of. 590
Nitrogen industry in. 598

Page

United States, The,
Organization needed in. 606
Petroleum in. 597
Public domain of. 591
River improvement for. 601
Rural progress in. 605
Salt mine of, illus. 596
School children in. 594
Spirit of. 590
Water power of. 598

"V"

Vathy, Rhodes. 245
Venizelos 329
Vernal Falls, California,
Illus. 84
Versailles Palace, illus. 487

"W"

Wallachia 362
WARFARE ON OUR EASTERN COAST, THE. 195
Watermelon patch, California,
Illus. 592
Wedding dance, A peculiar. 416
Westminster Abbey,
Illus. 287, 288, 289, 290
Text 286
Whitaker, Herman,
The Wonderland of California. 57
Whiting, John D.,
Jerusalem's Locust Plague. 511
Whitman's prophecy. 78
Wight, Isle of,
Illus. 47, 51, 52, 53
Text 41
Windsor Castle, illus. 276
WONDERLAND OF CALIFORNIA, THE. 57
WORLD'S DEBT TO FRANCE, THE. 491

"Y"

Yellowstone National Park,
Illus. 99
Yosemite Falls,
Illus. 83
Yosemite National Park. 67
Illus. 82, 83, 84, 87, 89
Yucca,
Text 57
Illus. 65

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CHANNEL PORTS—AND SOME OTHERS

BY FLORENCE CRAIG ALBRECHT

Illustrations from Photographs by Emil Poole Albrecht and A. W. Cutler

THE sturdy old vessel is coming into port after an eventless voyage. Seven days of ceaseless plowing through a shimmering sea, under a great round dome, now radiant light, now dusky velvet, star-sprinkled. The Scillys have floated by, foam-washed, mist-wrapped, fairly islands in a magic world all cloud and water. The stately white shaft upon Bishops Rock has risen, passed our vision, and gone down on the western horizon. Lands End thrusts its rocky headland toward us, and back of it, softly purple, lays Cornwall and England.

Steadily the ship goes on and smoothly the panorama passes—rock and headland and cliff, now green, now golden with gorse, now bare and rugged; inlet and bay and harbor, with here and there an isolated house, a tiny village, a pretentious town, a great port.

An unfriendly coast? Yes, with heavy seas and winds, with thick sea-fogs—a dangerous one; rocks ever ready to tear holes in the stoutest vessel, currents ever ready to drive them on. But a picturesque coast; a wonderfully beautiful coast, both upon summer days and in winter storms; a coast with many harbors, none too easy of entrance by reason of rocks and tides, many impossible for any but the smallest craft, but all made as serviceable as natural difficulties permit.

It was their picturesqueness, not their serviceability, which once occupied us so delightfully through long sunny days "before the war." That there was no suggestion of warfare in them I will not say; there are, in fact, very few English or Cornish ports which along with their vivid smugglers' tales do not mingle one or two of battle on sea or land.

MEMORIES IN EVERY PORT

Too many fleets have gone up and down the channel since history began not to have left memories in every possible port. But they were so long ago, those battles! So long ago that one saw merely the picturesque side of them—the valor, the courage, the victory; one saw the boats that came into harbor battered, perhaps, imperfectly manned, but with flags flying bravely and men cheering wildly; one did not remember those that had sailed away to come back no more.

How changed our thoughts today. The sea has closed over a bright young head we knew; not the glory, not the pride of victory flaunts its banners before our dazzled eyes; with clear, sad vision we mark the sorrow, the cost of war.

What are they like now, those ports, big and little, along the British Channel; ports from which we have watched the fishing fleets sail to the north or come in heavy laden; ports where great ocean liners came and went perpetually; ports

Photo by A. W. Cutler

ON THE EDGE OF THINGS IN ENGLAND: A SCENE AT LANDS END

On the left of the picture may be seen what are popularly known as the "last two stones in England," while the last man is seen contemplating the vast expanse of the briny deep in front of him. A glimpse is also caught of the Longships Lighthouse. There is a depth of 20 fathoms between the lighthouse and the coast, a distance of about three-quarters of a mile.

Photo by A. W. Cutler

A WILD, RUGGEDLY PICTURESQUE BIT OF THE CORNISH COAST AT PERTH, NEAR NEWQUAY

Photo by A. W. Cutle

A VILLAGE SCENE AT MOUSEHOLE: CORNWALL

One of the few old Cornish villages that remain to a great extent as of yore. Mousehole was an important port before London was a town. To it and the other small Cornish harbors the Phœnicians came for tin centuries before the birth of Christ.

where huge squadrons of grim, gray men-of-war gathered silently?

Penzance—what is Penzance today, the sunny pleasure-loving little sea city, whence came those picturesque stage-pirates that made tuneful our youth? The coast is no more beautiful here on Mounts Bay than elsewhere to east or west; not so rugged or so wild as on Cornwall's northern shore, but the curve of green cliff is very smooth and lovely, the sun shines warmly; the roses bloom; every baby ripple murmurs a sea story; every tiny breeze brings a legend. It is a fascinating place not only for what it is, but what it suggests.

Cornwall is Celtic, and to be Celtic is not only to believe in fairies, but to see them, and mermaids and pixies and many other fascinating things concealed from Anglo-Saxon eyes; so that a dull-witted tourist, unless he has been lucky enough to have had a Celtic great-grandparent—when, of course, he has "the sight"—may find some things rather incomprehensible. As to the pirates, let me tell two stories—one for those who understand, one for those who do not.

GETTING A FAIR START!

At Breage they tell a story of Germoe; at Germoe it is told of Breage; but there was likely little to choose between them; they are neighbors on this rocky coast. In one parish church, then, or the other, in the midst of Sabbath service, a head was thrust in at the door and a hoarse voice croaked: "A wreck! A wreck!" The congregation stirred uneasily; a man half rose, then another; in a moment there was a stampede for the door. "Halt!" rang out a stentorious voice from the pulpit; then, to the clerk, "Anthony, shut that door!"

The congregation was well trained; it knew its vicar. Man, woman, and child, for children took no small part in the business of wrecking, stopped in their tracks; the door clanged shut Blandly the parson elbowed his way between business of wrecking, stopped in their pulpit; his coat as well. At the door he turned his hand on the latch: "Now, my dear brethren, now we shall all start fair."

The other story concerns the first steamer which passed out of the channel. All the Cornish boats followed it for miles, quite sure it was on fire and that there would soon be "fair pickings."

MOUSEHOLE AND NEWLYN

Penzance, in spite of her superstitions and her saints, cannot "hold a candle" to her neighbors in antiquity or legends.

Little Mousehole, on her right, beyond Newlyn—lovely Newlyn, beloved of fishermen and artists, which last we saw in the long light of a summer sunset, her myriad of fishing-boats putting out in a path of gold over a silver sea, like huge brown butterflies fluttering over the edge of the world, while wives and sweethearts waved a last farewell from the quays, and on the cliff a handful of old men critically watched the fleet go out, the fleet that they should sail with no more—little Mousehole ("Mousel," in local speech) was an important port before London was a town (see page 4).

As for Marazion, to her left, who shall measure her years? According to Cornish history, "in the days of Ezekiel the prophet" it was already an important city, to which Phœnician merchants came for tin. For a town which has entertained Phœnicians and giants and has looked for centuries at a castled island floating in a marvelous sea, Marazion is remarkably dull No one goes there except to visit the island which gives the bay its name.

St. Michaels Mount, little brother to Mont St. Michel, off the Breton coast, is a rocky islet 230 feet high and a half mile from shore, with which it is connected by a natural causeway uncovered for about three hours at ordinary low tides (see picture, page 9). With southwest gales the island may remain an island for weeks, and with high seas be inaccessible even to boats. It is a most picturesque pile; its steep grassy slopes, in springtime yellow with a million daffodils, crowned with the irregular jumble of chapel and castle and ringed by a gleaming sea.

CORMORAN AND ST. KEONE

It has much history. Like the other St. Michael, it stood once in a forest and was pagan, Christian, druidical; it has

Photo by Emil P. Albrecht

FOWEY HARBOR FROM BODINNICK FERRY: FOWEY, ENGLAND

Once one of the great seaports of the kingdom, boats from Fowey sailed by scores to the Crusades, to the siege of Calais, to the plundering of Normandy. The shores are so steep, the harbor water so deep, that merchantmen of fair tonnage can lay up against the bank, the spars almost touching the trees.

been tenanted by saint and sinner, soldier, monk, and knight. Dearest to the heart, perhaps, is the story of Cormoran, whom later Jack-the-Giant-Killer slew, dearest perhaps because of the memories of a little girl and boy who loved the story long ago. We ought to prefer Saint Keyne—but, well, Cormoran is so human. Can you see the one-eyed monster playing "bob-button" with his friend, the giant, on Carn Brea? And the huge boulders they used for playthings! Ah! Cormoran was a real giant then and in his prime; doubtless he had grown old and weak and thin when Jack came.

The mount belongs now to the St. Aubyn family and Lord St. Levan admits strangers quite graciously at suitable hours. One may make a tour through its rooms if one likes, but it is pleasanter to sit among the grasses, where shy rabbits scurry to and fro, and read or dream.

Besides its legends, the castle has much real history, some of it martial. In the War of the Roses Henry II entered it as a pilgrim, held it as a soldier, while Perkin Warbeck marched toward London claiming a crown; the "Fair Rose of Scotland" sought shelter there; during the Civil War Roundhead and Royalist strove hotly for its possession.

WHERE PILCHARDS BECOME SARDINES

We may follow the coast-line eastward and southward to the Lizard, passing the great wireless station upon Poldhu, or cut across the little neck of land to Falmouth, a very fair harbor. Megavissey, beyond, is but a fishing port, where—may I hint it?—pilchards sometimes become sardines; but Fowey, to which we next come, has considerable past importance and present pride (see page 6).

Once one of the great seaports of the kingdom, boats from Fowey sailed by scores to the Crusades, to the siege of Calais, to the plundering of Normandy. "Fowey gallants" swaggered on all the then known seas, and when not busy with strangers turned to trimming their rivals nearer home. Finally, accused of piracy, Edward IV confiscated their ships and gave them to Dartmouth.

What a blow to a port which had sent more boats and men to support Edward III than any other in the kingdom! Fowey never recovered from this crushing injustice; but after a time she turned to peaceful trades and welcomed the stranger ships that she once barred out, filling them with barrels upon barrels of powdery china-clay.

There are remnants of forts upon each side of the harbor entrance, forts between which a chain was slung each night. In spite of the forts and the chain and a castle on the hill, invaders got in, however, Frenchmen coming to avenge a fight against a Genoese corsair in the hire of the King of France, in which the "Fowey gallants" seem to have had the best of it. Do you know the ballad of "John Dory," otherwise Giovanni Doria?

The grappling hooks were brought at length,
  The brown bill and the sword-a;
John Dory at length, for all his strength,
  Was clapt fast under board-a.

FOWEY'S GLORY GONE

That was in the days of good King John of France (say 1350), and in 1457 comes the invasion; and then, pouf! adieu to all Fowey's glory and hope. Once the greatest port in the kingdom, she has seen every rival outgrow her in favor and prosperity. Probably the little town is no larger today than then; certainly the harbor is the same — close locked, deep, smooth, shining green surrounded with steep tree-clad hills, and always boats coming and going through the narrow entrance, the entrance whose chain went to Dartmouth along with the fleet; boats at anchor far out on the mirror-like surface or tied up close to shore, the masts and spars mingling in astonishingly friendly way with trees or houses.

There are no men-of-war among them and no fishing-boats! Make no mistake there! Fowey is furious if taken for a fishing port. Peaceful merchantmen and yachts, these fill Fowey harbor, make its life. More than twoscore men-of-war she sent to Calais—770 men. How pitifully small are the figures today, when one modern battleship requires a larger crew than did that fleet 450 years ago. No 50 ships of modern type could find place in Fowey harbor today, but for smaller craft—submarines, destroyers—it affords admirable shelter.

That it is very lovely goes without saying; all Cornish ports are that.

UNSPOILED POLPERRO

Eastward again from Fowey upon the coast, in a cleft so narrow, so jagged, so rocky one wonders why men chose it for a home, lays Polperro, the most picturesque, the most unspoiled of Cornish fishing ports, retaining all its ancient dignity of life and labor unfluttered by the summer villas now beginning to crowd the cliffs above its head. They will not crowd too closely. What Polperro thought a grievance is perhaps a blessing in disguise—the huge scaffolding, which, with another a mile away, the admiralty uses as a speed test for warships in the channel. Hotels will not wish nor be permitted to draw near these marks, and Polperro may keep her cliffs free yet a little while.

> By tre, pol, and pen
> Ye shall know the Cornishmen.

So it is not surprising to find these prefixes figuring in the names of their towns: *tre,* a dwelling; *pol,* a pool; *pen,* a headland; as *Polperro,* Peter's pool; for to whom could a fishing town be more appropriately dedicated than to St. Peter. Cornwall is ardently Methodist; but be in Polperro on July 10, "Peter's Day"—look and listen!

But Polperro did not always depend upon fish for a living. In the days when smuggling was a profession, if not an art, Polperro had few rivals, and, reading those old tales, one sees quite clearly why men chose these clefts for habitations. Conveniently near are coves and caves, undiscoverable by the keenest customs officers, and boatmen could sail in and out these narrow rock-bound harbors fearing no pursuit.

"PARSON HELD THE LANTERN!"

There are hints of even darker deeds than smuggling. That was readily condoned, if not lauded—boats were made for better things than to carry fish. And when it comes to wrecking, Polperro's own son and historian, Jonathan Couch, rather intimates that it would have been flying in the face of Providence not to make use of that rocky shore.

"All joined in the business," he says; "the smith left his forge, the husbandman his plow; even women and children turned out to assist in the unlawful traffic and received their share of the proceeds." "Didn't the parish priest put a stop to such wickedness?" is asked. "Oh! parson? No; he didn't say much one way or t'other; parson, he just held the lantern."

Those were Polperro's palmy days, when the price of fish in the London market troubled her not at all. And the bold seamanship she practiced stood her in good stead when she went, as often she did, in His Majesty's service to the wars with France. And if today you see broad-shouldered loiterers on the quay do not condemn them utterly.

The fishing is not what it was; the other sea trades are long since out of fashion; but once more Polperro hears the call "to His Majesty's service," and I am sure makes the usual Cornish answer. Cornish mariners, "Fowey gallants," if you will, built up the first great English navy before the Devon sea-dogs and Sir Francis Drake took it in hand. And there are no better or braver seamen today than these who in tiny boats brave for months the rigors of the Arctic seas that their families may live.

Polperro's chief catch, however, is mackerel, crabs, and conger. There are few, if any, conger-eel in American waters; they are to some people a most unpleasant-looking fish. Cornwall esteems them highly and makes them into pie with much cream and parsley.

CORNISH SQUAB PIE

Cornwall makes many things into pie and the names are deceitful. "Squab pie" sounds appetizing until one learns that almost everything but squabs goes into it—fat mutton, onions, apples, raisins, possibly "saffern" (saffron), and a liberal bath of clotted, or "clouted," cream as a finish.

There is a funny story concerning Cornish "pasties." It is usually told in Devon.

The devil came one day to the banks

ST. MICHAELS MOUNT: A VERY BEAUTIFUL CASTLE-CROWNED ISLAND AT EACH HIGH TIDE

At low tide a half mile of wet sand and a rocky causeway lay between it and shore. It is approximately a mile in circumference and 230 feet high. Its first tenant was the giant Cormoran, whom Jack-the-Giant-Killer slew, or so 'tis said. Next were Druids, then Christian hermits, the priory of St. Michael, St. Keyne, finally a feudal castle which belongs to the St. Aubyn family and remains today. Of the earlier tenants there is small trace. The tiny fishing village at the foot of the mount is St. Aubyn's Arms (see text, page 5).

Photo by A. W. Cutler

THE LAST POST-OFFICE IN ENGLAND, AND A PRIMITIVE ONE

It is situated close to Lands End. The last man is seen in the act of posting a letter, and the last woman is about to purchase a stamp for one

Photo by A. W. Cutler

A STREET CORNER AT THE QUAINT LITTLE CORNISH FISHING VILLAGE OF NEWLYN

Photo by A. W. Cutler

A CORNISH FISHWIFE AND HER BASKET OF FISH—A FAMILIAR SCENE AROUND NEWLYN

These old baskets, called cawels, are rapidly disappearing. Note the curious method of carrying the basket—by means of a band around the head, or, rather, suspended from the head.

Photo by A. W. Cutler

A STREET CORNER AT THE OLD CORNISH FISHING VILLAGE OF NEWLYN

These steep, narrow streets running up straight from the harbor are typical of the quaint fishing villages around Penzance. Note the thatched roofs

Photo by A. W. Cutler

A WAYSIDE CHAT IN CORNWALL

The woman with the donkey and cart is on her way to Penzance, while the fishwife with whom she is exchanging experiences is on her way home to the fishing village of Mousehole. The basket suspended from her head is known as a cawel

of the Tamar, the rippling river that divides Devon and Cornwall, and looked over at the rocky land beyond. Its gaunt moors, where the rocks break easily through their crusts of ungenerous soil, the great barren cliffs stepping down roughly to a tempestuous sea, contrasted unfavorably with Devon's luxuriant valleys.

His majesty looked at the swift current and shook his head. "No!" he said finally, "No, that's no place for me! Every one who goes there is turned into a saint and everything else into squab pie. I'm fit neither for one nor the other!" And he stayed in Devon. Now, on whom is the joke?

There has been much attempt recently to compare Polperro with Clovelly, on the Bristol Channel; but why make comparisons? Some one is sure to be hurt and no one helped. Yet as it is not very easy to get anywhere from Polperro, which is 6 miles from Bodinnick Ferry and Fowey and 4 from Looe by the hilliest of roads, and quite off the line of railroads, we can almost as cheerfully take the "long jump" to Clovelly now.

But before that let us look attentively at Polperro, at its closely huddled houses, built on and in and of the rock; its roses and fuchsias and clematis, which bloom as luxuriantly as in southern climes; for these rock clefts are sheltered from winter winds and warmed by the southern sun; at its little rock-bound gleaming harbor, where at high tide the boats rock lazily and at low water a thousand silvery gulls pick up their dainty feet discreetly in the ooze; at its steep, slippery cliffs, whence one has such glorious breezy views of sea and rock and headland, and of the warm sheltered valley at one's feet (see pictures, pages 17 and 19-22).

POLPERRO KNOWS NO "DRUMMER"

Let us glance at the net-making and boat-mending and sail-painting, at the big baskets of wicked brown crabs, at the conger hanging on the scales, at the big, quiet men, who work on undisturbed by the foreign visitor. No one asks if you wish anything, no one offers to sell or to hire. They will welcome you at the tiny inn if you go, but the mistress will not seek you out. You may hire a boat if you like, but no one will ask if you wish to.

Polperro attends to its own business, and that does not include catering to tourists. There are always artists at Polperro. They and the fishermen observe each other, become friends, perhaps; but business is not mentioned between them.

"THE MOST EXQUISITE VILLAGE IN ENGLAND"

Clovelly fills a rock cleft on the north Devon shore as Polperro does upon the southern Cornish one, but there all comparisons end. Clovelly may be still an earnest fishing village, but her looks belie it. "The most exquisite village in England" some one called her, and she deserves the title (see pictures, pages 24 and 26-29).

From the coach-road where, at the top of the cliffs, you enter upon Clovelly's one street, to the sea; or, if you come by boat, from the harbor to Hobby Drive, and the public road, everything is dainty, elegant of its kind, groomed to impossible perfection. No whitewash gleams whiter or bluer or more delicately yellow than here at Clovelly; no roses, fuchsias, clematis, nor lilies bloom in more profusion; no trees are richer and greener, no vines more luxuriantly graceful, than there. Never a bit of paper litters that one stony street, more staircase than roadway; no speck of dust mars shining windows or spotless curtains; no noise of railroads, of trolley cars, of traffic, breaks the soft stillness of this village of delight.

Plodding up the street on little clattering hoofs comes a string of tiny gray donkeys, bolting now into one house door, now into another, seeking a level spot to rest, and twitching their sympathetic ears impatiently as each time they are persuaded out and up again. Down the street goes a long procession of tourists arriving by coach from Bideford or Boscastle, stopping at every house to "Oh!" and "Ah!" and perhaps to buy souvenirs or to eat strawberries and clouted cream.

It is upon these hordes of tourists, who all the summer days go up and down this

Photo by Emil P. Albrecht

WATCHING THE FISHING FLEET DEPART: NEWLYN, ENGLAND

Every point of vantage on the sea-wall is tenanted when the fleet puts out to sea. There are few young men in the throng, and they are landsmen. One needs to stand near a couple of "ancient mariners" to get the full flavor of the occasion. No trick with rudder or sail escapes those critical eyes and tongue.

"Cornish mariners built up the first great English navy before the Devon sea-dogs and Sir Francis Drake took it in hand. And there are no better or braver seamen today than these who in tiny boats brave for months the rigors of the Arctic seas that their families may live" (see text, page 8).

Photo by Emil P. Albrecht

IN A CLEFT SO NARROW, SO JAGGED, SO ROCKY ONE WONDERS WHY MEN CHOSE IT FOR A HOME, LAYS POLPERRO

Polperro lives entirely by fishing. The huge basket of crabs will go with others to the London market. Polperro harbor presents difficulties to the boatmen; the cliffs close in steeply and narrowly, the current runs strong, and the tides rise high. It is only around high tide that the inner harbor is accessible. When the tide goes out it leaves it bare, almost dry (see page 8).

steep, stony street, that Clovelly lives. It seems a resort, a most charming, most lovely resort, a place of day excursions rather than of serious business. It has had, like every other British port, its share of very serious business in the earlier days of history, when men-of-war were small; it may still, on other than summer days, go vigorously about fishing; but in pleasant weather its largest profits are derived from the Bristol boats and the Bideford coaches, which deposit a constant stream of visitors at the top and bottom of the comb.

THE LAND OF "LORNA DOONE"

Very different from Clovelly is Lynmouth, farther eastward on the Bristol Channel; for although Lynmouth states frankly that it is a resort—advertises itself as such—it seems to be sufficiently occupied with other things not to thrust it insistently on the visitor. Lynmouth lies in a valley down which a river, or rather a combination of two tiny rivers, comes to the sea; and, as in all of these warm, moist valleys, vegetation thrives amazingly, Lynmouth, too, is wreathed and draped in bloom (see page 32).

On the cliff above her head is her twin sister, Lynton—breezier, bolder. It is a difficult tourist who cannot be satisfied at one or the other place. But of sea tales one hears less here, perhaps because it is the land of "Lorna Doone," and all paths lead back inland to the spots that Blackmore made famous (see page 30).

Yet in another generation this and many another little port upon this coast may have tales enough to tell; many a load of shipwrecked men may put in with reports of submarines. For such as these the tiny ports will be a welcome haven. If they can send no ships to the war, they can help to save men. Ilfracombe, Lynmouth's neighbor, has already given service, castaways from the *Dumfries*, torpedoed off Hartland Point, landing there. Appledore, just beyond, would also be a good port (see pages 33-35).

At Clovelly one must read Charles Kingsley, if never before; his father was rector there, and no reader of Westward Ho! can hear again with indifference the name of Appledore. But we may not tarry now; we must get back to the south coast, but let us do it by way of Boscastle and St. Ives.

We are in Cornwall once more, soon after leaving Clovelly; we will shun Hartland Point, and Bude will not long detain us, although it has some pretentions to popularity. It has a sizable harbor, but a dangerous one. This coast, exposed to the whole direct force and fury of the Atlantic, is known as the "Ships' Graveyard," which tells the tale. Boscastle, south of Bude, is charming. In the clear waters of its tortuous but lovely harbor baby seals play, their smooth, round heads and shining eyes sometimes startling the swimmer out for his morning dip (see pages 38-39).

"MEAT AND 'TATIES"

Seals recall one of Mr. Hawker's stories. Long ago he and a friend came hungry into Boscastle and Jean Treworgy fed them on "meat and 'taties." "Some call 'em '*pur*taties'," she said, with the same sniff that a Devonshire farmer gave when his son spelt " 'teddies" with a "p."

The meat was good, juicy, tender, savory, but neither the parson nor his friend could guess what it could be. They asked Jean. "Meat and 'taties" was all her answer. Beef it was not, veal, nor sheep, nor pig. Could it—could it be "Boscastle baby"? Hawker rushed to the kitchen. "Meat and 'taties," repeated Jean.

In an ancient book it is written: "The sillie people of Bouscastle do catch in the summer seas divers young soyles (seals) which, doubtful if they be fish or flesh, conynge housewives will nevertheless roast and do make thereof very savory meat." So they called them "meat," or "Boscastle babies;" but the tourist and the seal are both safe today—one eats them no more.

KING ARTHUR'S CASTLE (PAGE 40)

At Tintagel more than at any place, perhaps, what we bring measures what we take away. Come full of the Arthurian legend; come with Tennyson, with Hawker, with Mallory, and, in spite of

Photo by Emil P. Albrecht

FISHERMEN OF POLPERRO, ENGLAND

The houses at Polperro perch as best they may on ledges of rock, their foundations; the staircases by which they are reached are hollowed from the rock itself. The men are not idlers—the tide is out, the harbor bare. They must wait for the sea to float their boats.

Photo by Emil P. Albrecht

MAKING PORT: POLPERRO, ENGLAND

It goes without saying that Polperro men are fine boatmen. One glance at the port, with its rocks, its breakwaters, its narrow stone-walled entrance, would prove that

Photo by Emil P. Albrecht

THE ENTRANCE TO THE INNER HARBOR: POLPERRO, ENGLAND

The photographer stood on a similar stone breakwater. The narrow entrance can be closed in time of need by huge beams let down in grooves. By the thickness of the stone walls one may measure the strength of the winds and waves in winter storms.

Photo by Emil P. Albrecht

WEIGHING CONGER EELS: POLPERRO, ENGLAND

Polperro lives by fishing, and a large part of her catch are conger eels—huge, unpleasant, ghastly white creatures that Cornwall considers delicious, especially when transformed into conger pie. Here we see them being weighed in bunches of four on the great scales on the fish-house quay. They can attain a length of 10 feet and a weight of 100 pounds, but the majority run about 6 feet and 60 to 70 pounds.

Photo by A. W. Cutler

THE ROAD TO THE SEA

This is a scene at Church Cove, Cornwall, one of the very few villages in Cornwall that has not lost its old-world charm. The lower whitewashed cottage was at one time the only inn in Cornwall and was a favorite rendezvous for this section of coast in the old smuggling days.

Photo by Emil P. Albrecht

CLOVELLY, THE MOST EXQUISITE VILLAGE IN ENGLAND

Clovelly from "Hobby Drive," a beautiful private road running for three miles through luxuriant forest high above the sea. In the picture can be seen the little harbor, then dry, the stone pier, the pebble beach, and Red Lion Inn; but the cleft in which the village lies is so narrow and deep that above one glimpses only a house or two (see page 15).

"modern criticism," you will savor nought but romance.

Bring history as a companion if you will; learn that here was the home of ancient earls; that the cliffs are the highest, the surf the strongest, in all Cornwall; that the ruined castles are Norman, the ancient church Saxon; but no longer can you hope for vision of the "Blameless King;" see his knights climb to the castle or talk with the Cornish chough, the red-footed, red-beaked raven that Tintagel calls "King Arthur's soul."

Once there was a day when every rock-marking in eastern Cornwall spoke of Arthur, when every wave lapping its western shore babbled his name. The actual Arthur may have been but a petty British king "living in the dark interval between two civilizations," but his name lives immortal, unlimited by race, or state, or clime, in every heart which reveres chivalry, honor, and truth.

Can you see them, hear them, Arthur's knights coming up to sit at the round table? Is it only the thunder of the long surf far below, the shriek of a gull, the chough's call that reaches your ear? That silvery chime is the sunken bells of Forrabury, pealing far below the sea; that swift-winged boat is the *Black Prince,* whose daredevil master was the terror of the coast. Take the key, climb above to the door of the old keep, and high above sea and shore look and dream if you will.

Here are the ruins of Tintagel about you; across the chasm the yet more formless remains of Terrabil, the twin fortresses known to the earliest Cornish earls. Roman, Saxon, Norman has built here; but it is not for architecture or archæology that one comes here; it is for romance. "It befell in the days of Uther Pendragon"—yes, we all know Mallory's story; but why, oh why did "Gourlois of the Purple Spear" lock himself in one castle and his wife in the other? There are many questions at Tintagel that are never answered (see page 40).

It is no soft landscape here. A high, bleak, wind-swept cliff, dropping sheer to the sea, which pounds it perpetually; but such a sea—turquoise, green, sapphire, violet, spread with clear, lace-like foam, or lying smooth and still beneath the cliff's purple shadows. Into the sharp rock-cleft it runs with savage force and sends huge clouds of spray to lick the wet, black rocks above.

Higher upon the steep sides the turf grows short, but thickly, and topaz-eyed sheep pasture fearlessly in the smell of the salt spray. But no longer Ygrayne walks sad-eyed upon the terrace, thinking of her dead lord, nor Guinivere watches impatiently that way which Launcelot should come, nor Arthur marshals his knights. There are tourists, and that is all. Yes; one must bring romance to Tintagel if one would take it away.

PICTURESQUE ST. ISAACS

Tintagel is not a port. Occasionally a boat comes in under the cliff with supplies for the village, but houses are few and there is little fishing. Port Isaac, farther down the coast, is, I was about to say, a typical Cornish port; but I fear I have said that of another. It *is* typical. They are all alike and unlike. I think the steepest carriage road it has ever been my pleasure to descend comes down into Port Isaac; and the little stone houses of the village cling to the sides of the ravine as best they can.

As a harbor we should not approve of it, yet it has served a fishing fleet for 400 years. Pleasant enough it is of a summer day, but in spring or autumn storm, when the waves come hurling in with appalling weight and force to suck out again, as if they would drag the village into the depths, when the fleet jockeys for hours in the trough of a vicious sea, unable to make the opening between the black cliffs, yet in constant peril of the surf, one can but wonder why men made a home there (see page 46).

THE "REAL" ST. IVES

Now St. Ives is different. Storms are just as severe there, of course, but the harbor is better protected. The tides are too great in these Cornish ports to be manageable. They are deep enough at high water for large vessels, but a few hours later they have gone out completely and left the sands bare. One

Photo by Emil P. Albrecht

CLOVELLY HARBOR WHEN THE TIDE IS OUT: CLOVELLY, ENGLAND

This is what Devon calls a "pebble beach," but the pebbles are what Philadelphia, in the days before asphalt paving, knew as cobblestones. There is much of this on the Devon coast, and the sound of the water rushing through and over them with the change of tides is one that is never forgotten.

Photo by Emil P. Albrecht

CLOVELLY HARBOR WHEN THE TIDE IS IN: CLOVELLY, ENGLAND

The boat marked 713 B. D. is probably from Bideford. The little stone pier is a favorite lounging place at sunset. Clovelly has had, like every other British port, its share of very serious business in the earlier days of history, when men-of-war were small.

Photo by Emil P. Albrecht

BEGINNING THE CLIMB FROM THE SEA THROUGH THE VILLAGE: CLOVELLY, ENGLAND

The narrow little street twists and turns and at one place, Temple Bar, passes directly beneath a house. It is lined with stone cottages, tiny gardens, stately trees, and embowered in flowers that bloom with incredible luxuriance. The tiny donkeys are carrying sacks of coal from a boat to some householder up the hill. Whenever an excursion boat arrives they drop their packs and, brushed and saddled, appear in a pretty friendly row by the quay.

Photo by Emil P. Albrecht

THERE IS NOT MUCH PRIVACY IN CLOVELLY, ENGLAND

One's windows look directly into one's neighbors unless there has been forethought and the house built "askew." Vines make charming curtains and flourish here as nowhere else; fuchsias will make a screen, a tree, or a hedge, as one desires.

Photo by Emil P. Albrecht

THE CLIFFS AT SUNSET FROM THE NORTH WALK, LYNTON: LYNMOUTH, ENGLAND (SEE PAGE 18)

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could talk long and lovingly of St. Ives, which has the loveliest bay in Cornwall.

Here is no narrow chasm, where houses squeeze and crowd like swallows' nests and great rocks bar the way. St. Ives sits by a smooth circle of sea into which a tongue of rocky land thrusts a bold curving headland, inclosing an inner harbor in the great sweep of the bay. Here by the sea dwells the "real" St. Ives, close-pressed, low-crouched, stone-built to withstand the worst storms of sea and time.

Up the green hillside climb the summer homes, the villas and cottages and hotels, that belong to the transient St. Ives. As its mean winter temperature is but 4 degrees lower than that of Rome, it has a fair percentage of winter visitors, while in summer its hotels are crowded. St. Ives does not let its visitors interfere with its business, which is pilchard fishing—a picturesque thing to the idle onlooker, but heavy-smelling work for the fishermen—and renting studios.

It has been said that of the 200 or more canvases dispatched each year from Cornwall to London "seven-eighths have been painted at Newlyn or St. Ives." Certainly, in the tangled streets of the little town, wherever a window gives upon the sea be sure an easel stands.

St. Ives gets its name from an Irish princess, St. Ia, who floated thither upon a leaf and landed on Pendinas, the rocky headland which St. Ives calls "the island." "Are there many saints in Cornwall?" I once asked a Cornish friend. "Don't you know the old saying?" he replied. "There are more saints in Cornwall than in heaven." I'm not prepared to dispute it, and certainly the Cornish saints have arresting names and habits.

"A LADY SAINT INDEED"

My St. Ia has been hotly contended, I must admit. "A lady saint indeed!" cried the artist scornfully. "Just go to Brittany and learn what *extraordinary* things St. Ives did there! Things no *lady* saint would have done!" Just as if only masculine saints did extraordinary things!

It was in 450 that St. Ia drifted in on her leaf and suffered martyrdom. The Irish saints had delightful means of traveling. St. Piran came on a millstone. Any one who has seen a Welsh coracle will understand. In Cornish the place is called Porth Ia, and the square-towered church there by Porthminster sands commemorates the name. In its tiny yard is a beautiful old cross dug up a century ago from the place where it had lain for how many hundred years? We like to think it St. Ia's own, but there are those that say it is later, and others who maintain it is older far than she. The stone of it, like that of many another Cornish cross, was probably part of a menhir, those curious druidical monuments frequent in Cornwall and Brittany.

At St. Ives we touch "modern conveniences" once more, and by changing trains twice may reach Polperro's nearest coast neighbor, the two Looes; for they are two, on either side of a trickling "littel broke that cometh down out of the hilles" to the sea, with a quaint old legend-bearing bridge to bind them, like many other Cornish ports.

The houses are in all shades that "whitewash" yields—blue, pink, lavender, corn, or silvery gray—framed in their honeysuckle, roses, and rich trees, climbing the hills upon both sides of the way. Upon the river's east bank there is a level stretch permitting a roadway, but the west bank leaps straight up from the water edge.

LOOE'S BRAVE HISTORY

The towns are not *very* ancient, but before the days of Elizabeth they had sent many boats to the wars with France and Spain. Details of these are hazy in Looe minds, but one thing holds fast—one boat sailing from the port must be a *George,* in memory of a *George* which took three Spanish galleys single-handed in an "international unpleasantness" hundreds of years ago.

There is the island off the western cliff, scene of many adventures in those gay, swaggering days gone beyond recall. Delicious is that one where the fast-sailing smugglers derisively offer the revenue cutter a tow-line. Looe depends upon her summer guests and her fishing-boats, of which about 50 go to the fisheries off the Irish coast. Those fishing-boats,

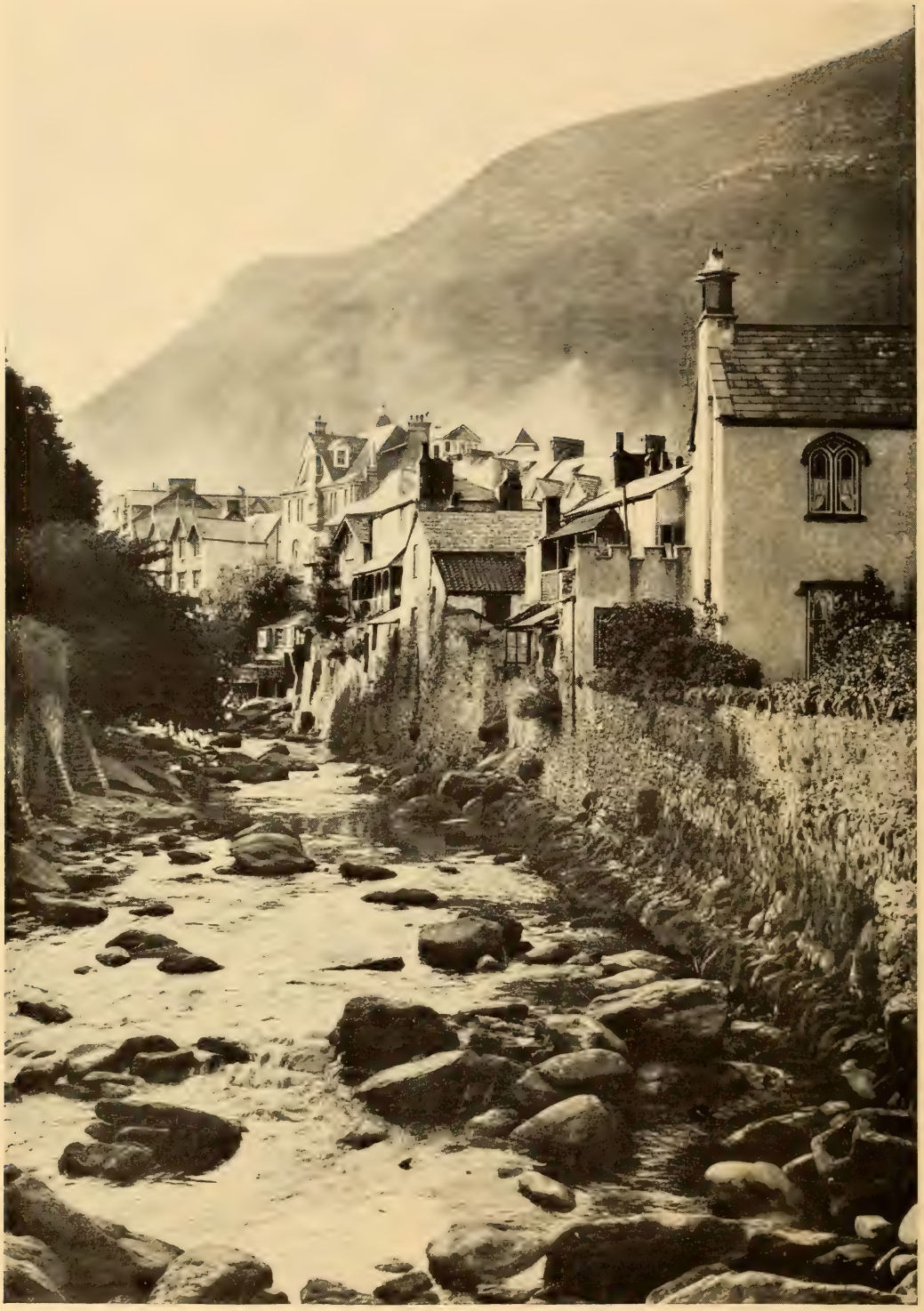


Photo by Emil P. Albrecht

THE LYN JUST BEFORE IT REACHES THE SEA: LYNMOUTH, ENGLAND

It is 5 o'clock, and the tea-kettles are boiling and bubbling, as the smoke from a dozen chimneys testifies. Lynmouth is frequently termed "the loveliest village in England" (see page 18).

Photo by Emil P. Albrecht

APPLEDORE, ENGLAND: ON THE SEA-WALL, MENDING THEIR NETS

Photo by Emil P. Albrecht

THE HARBOR OF APPLEDORE PREPARING FOR A HOLIDAY: APPLEDORE, ENGLAND

No reader of Charles Kingsley needs introduction to the tiny port upon which he dwelt so lovingly in "Westward Ho." One comes to it from Bideford, "the little white town of Bideford sloping upward from its broad tide-river," and hears here "the everlasting thunder of the long Atlantic's swell." Bideford is, I think, the nearest railway station for Clovelly (11 miles), the usual one, at all events, and Appledore is but a few miles away on the coast.

Photo by Emil P. Albrecht

WHEN THE TIDE IS OUT AND THE BOATS SETTLE TIPSILY ON THE SANDS: APPLEDORE, ENGLAND

Photo by Emil P. Albrecht

BUDE: ENGLAND

Bude's harbor is protected by a broad dike or breakwater—a pleasant promenade on summer days, but a very dangerous one in high winds and tides. "It has a sizable harbor, but a dangerous one. This coast, exposed to the while direct force and fury of the Atlantic, is known as the 'Ships' Graveyard,' which tells the tale."

which seem so insignificant to us, are but little smaller than the fleet which went to meet the Spanish Armada here near Looe. Few boats carried a score of men. How incredible it seems!

BROKEN LEGS THAT REQUIRE NO AMBULANCE

It would be a pity to see these tiny ports for the first or only time at low tide; but sometimes there is no help. Then, if one hears a hoarse voice calling that Sallie or Lizzie or Margret "'ave broke 'er leg!" "'Er 'ave broke 'er leg!" one need not wish for an ambulance. Every boat is provided with crutches or "legs" to hold it level when the sea leaves it on the sand. When a leg breaks the vessel keels over on the ooze, messing things up inside, and all hands must turn out to right her and mend the broken crutch; but if the tide be high and the sea reasonable, it were well to take boat and sail up the coast to Plymouth, where our big steamer long since came in.

Let us hope that the sunset was turning to rose and gold the tall white shaft on Eddystone; that the sea and sky were softly glowing like the heart of an opal, and the green hills about the sound, the "monstrous lump of granite," which is Dartmoor, purple in the distance, the town itself gleaming white in the dusk and sprinkled with lights like stars, are all bathed in that level liquid light that transfigures most prosaic objects in a northern landscape and makes of the loveliest harbor in England the most entrancing one in the world.

MAYFLOWER MEMORIES

One after the other the little Cornish ports bore the proud title of first in all England and laid it down; there is none today that can compete with this, their great Devonshire neighbor, whose rise has been constant since the days of Hawkins and Drake. Three towns form modern Plymouth—Devonport, Stonehouse, and Old Plymouth—divided from each other and bitten in by much blue water, which is now river mouth, now sea estuary, with considerable naval history of various kinds.

But the casual visitor troubles himself little with the stone streets and stone houses of the towns; it is the sound and its tributaries that engage his eyes. To the right, as one enters, the Cattewater, the mouth of the Plym, tucked in beneath the citadel; Sutton Pool, the home of small craft of many kinds, fragrant with fish and *Mayflower* memories; the docks of the London and Southwestern Railway; then the broad stretch of the Hoe, Plymouth's ancient bowling-green and present promenade, with old Eddystone lighthouse ending its days ashore as a view-tower; Sir Francis Drake challenging attention from his pedestal, and Britannia, as Mr. Howells says, "leading her lion out for a walk; lions become so dyspeptic if kept housed and not allowed to stretch their legs in the open air!" Upon the pedestal is written: "He blew with His winds and they were scattered." Britannia lays no claim to defeating the Armada all alone. One makes no criticism there, but a few trees would improve the Hoe.

Plymouth has a very considerable merchant trade, but she lets nothing interfere with her position as a fortress of the first class and naval arsenal. She has only grudgingly permitted ocean liners to use her as a port of call, and none come far up the sound nor tarry longer than to discharge mail and passengers. She has various reasons for not desiring them; they interfere with her plans.

PULL UP IN A HURRY!

I remember well hearing, one black night, when with some difficulty we had crept up the sound, our captain hailed gruffly: "Pull up in a hurry there; we're at target practice and you're right in the line of fire!" And I also remember well—but it is too scorching hot for ink—what the captain replied. A very trivial annoyance, but an annoyance, is the landing tax she charges for those not going immediately out of town—two shillings, I think it is—but the forewarned voyager buys a thripenny ticket to Saltash, the nearest station, and uses it or not as he pleases.

The citadel which Charles II built as a hint to a town which had stood staunchly by Cromwell is of little use ex-

Photo by Emil P. Albrecht

THE TINY HARBOR OF BOSCASTLE, ENGLAND

The village and its harbor, difficult of entrance, but so pretty in its wall of green cliffs, flushing rose-purple with blossoming heather. The name is a corruption of Bottreaux Castle, but of the castle there is no trace. Sir Henry Irving called Boscastle "the prettiest village in England" (see page 18).

Photo by Emil P. Albrecht

BOSCASTLE: ENGLAND

Even in fine weather boats must be towed or warped into this tortuous harbor. The water is deep and clear, too cool for American bathers, but just right, apparently, for the baby seal that occasionally make it a playground (see page 18).

Photo by Emil P. Albrecht

KING ARTHUR'S CASTLE: TINTAGEL, ENGLAND

Upon the great rock, which the sea threatens to make an island, is perched Tintagel. On the right is a small remnant of Terrabil, the twin castle on the mainland. According to the Arthurian legend, Uther Pendragon, King of Britain, falling in love with Ygrayne, wife of Gourlois, Duke of Cornwall, besieged them here in these two castles, slew the duke in one and speedily married his wife in the other (see page 25).

cept as a barracks. Plymouth's defenses are a great ring of forts at her back and the dull-gray fleet in the Hamoaze.

This may consist of only a few old boats, kept as shining examples of what should not be in naval architecture, or it may be a huge fleet, ranging from dreadnoughts to submarines. The boats come and go constantly in summer weather for practice cruises, speed tests, target practice; but occasionally there are maneuvers that bring them all together here, when one dwells with some amusement on the 150 ships which waited here 300 years ago for the ill-fated Armada.

There is a fearfully old Plymouth back of the modern, the Elizabethan port. Trojans and giants wrestled upon the Hoe, prehistoric man dug his rude cave dwellings in the cliff; but it is impossible to consider all this believingly today. The name of Plymouth brings the bang of big guns, the crash of military music, the rush of swift boats, the fluttering of pennants, and the overwhelming natural loveliness of a favored port.

IN A PEA-SOUP FOG

It must be at once stated, lest I hear a doubtful whistle, that Plymouth in a winter sea—worse yet, Plymouth in a channel fog—is neither favored nor favorable. She is not alone in suffering from those "pea-soup" fogs that make navigation in the channel perilous, but it was fearfully exasperating to hear by wireless from Southampton, "Beautiful sunshine," while we fumbled outside of Plymouth in a fog too thick to breathe.

We had seen the fog ahead of us like a curtain as we steamed up the channel; had slipped into it slowly, our bow disappearing before our eyes like a conjurer's trick, and in that wet whiteness, like cool steam, we crept onward for hours. There is always speculation if, in a fog like that, the tender will come to meet the boat; but in our case it did, and no sooner were our passengers and the mail bags on it than we were crawling out again toward Cherbourg. The rest of the story belongs there, but the tender bungled about the sound all night before it landed its wet, tired, sleepy passengers at Mill Bay, which it usually reaches in 20 minutes.

But as Southampton does not always have the sunshine nor Plymouth the fog, there need be no jealousies. The coast is dotted with picturesque but tiny ports; after one has seen Plymouth these seem insignificant. And Southampton, while a great port, is not a rival; for while Plymouth makes no bid for great merchantmen, Southampton invites them, leaving the care of naval vessels to her neighbor, Portsmouth, the chief naval station in England.

Both are protected from the channel's rougher moods by the Isle of Wight, which lays, bluntly diamond-shaped, before them. Spithead, the roadstead between Portsmouth and Ryde, one of the chief ports of the island, is left largely to the naval fleet, while the merchantmen come and go through the Solent to Southampton.

WHERE THE TIDES MEET

It is at the mouth of the Solent that one passes the famous Needles, three white, jagged chalk rocks off the western end of the isle—picturesque enough in summer weather, but dangerous in storm. The tides sweep in upon both sides of the Isle of Wight, that from the North Sea, that from the ocean, and prolong high water for two hours (see page 47).

To this as well as to its sheltered position Southampton owes its importance. The town lays upon a point between two rivers, the Itchen and the Test, the whole lower end of this point being devoted to wharves, docks, and basins accommodating the largest vessels. More than 3,000 vessels enter the port yearly, many of them huge ocean liners, but since the beginning of the war Southampton has been entirely closed to shipping. Its present defenselessness may be in part responsible, for while once a fortified place, the remnants of its walls and gates are now preserved merely for their picturesque or historic values; but its proximity to Portsmouth is the stronger reason.

Portsmouth is strongly fortified and is an important garrison town as well as

Photo by Emil P. Albrecht

THE ROAD TO THE CLIFFS AND SEA: TINTAGEL

On the cliff to the left are the ruins of the "Castle of King Arthur," where Arthur's knights sat at the round table. "Seeing his end was near, Arthur bade his last faithful knight to carry him to Bozmare Pool and throw in there his sword. Three queens appeared and bore him away from his sorrows. Some say he still lives in fairyland and eventually will reappear to reinstate his Order of Knights of the Round Table" (see page 25).

Photo by Emil P. Albrecht

THE RUINS OF KING ARTHUR'S CASTLE: TINTAGEL, ENGLAND

Of the earliest castle there remains little trace. Briton and Saxon had their strongholds here, but the few ruined battlements left today are probably no earlier than Norman times. Scores of sheep pasture fearlessly on the slippery slopes which plunge so swiftly to the sea. The whole "island" seems once to have been within the fortified area that was Arthur's stronghold. There are remains of a small chapel, a well, and a so-called hermit's cave on the plateau which forms the high ground of the "island."

Photo by Emil P. Albrecht

IN THE "GREAT HALL" OF TINTAGEL CASTLE: TINTAGEL, ENGLAND

The hall is open to the sky, the sun and stars look down in turn upon its turf-clad floor, the grasses grow where once Ygrayne watched the siege of Castle Terrabil and her husband's defeat, where she married, that same day, his conqueror. It was of this marriage that that Arthur was born who organized the Knights of the Round Table and sent them on their mission of punishing vice and rescuing oppressed virtue, for the love of God and of some noble lady.

Photo by Emil P. Albrecht

THE DOOR OF THE KEEP: TINTAGEL CASTLE, TINTAGEL, ENGLAND

Narrow, steep steps lead from it down the cliff. It is the only exit or entrance. From it one has a glorious picture of swirling, pounding water, the Atlantic's strongest swell; of rock, black and foam-wrapped, and green cliff basking in the sun.

PORT ISAAC: THE HARBOR AT LOW TIDE (SEE PAGE 25)

The great chains, lying like snakes black on the wet, shingly sands, are used to anchor the fishing boats. The port is but a cleft in the rocks exposed to the western winds and in winter a precarious shelter. In summer it is marvelously picturesque. "If one hears a hoarse voice calling that Sallie or Lizzie or Margret ''ave broke 'er leg!' one need not wish for an ambulance. Every boat is provided with crutches or 'legs' to hold it level when the sea leaves it on the sand. When a leg breaks the vessel keels over on the ooze, messing things up inside, and all hands must turn out to right her and mend the broken crutch" (see text, page 37).

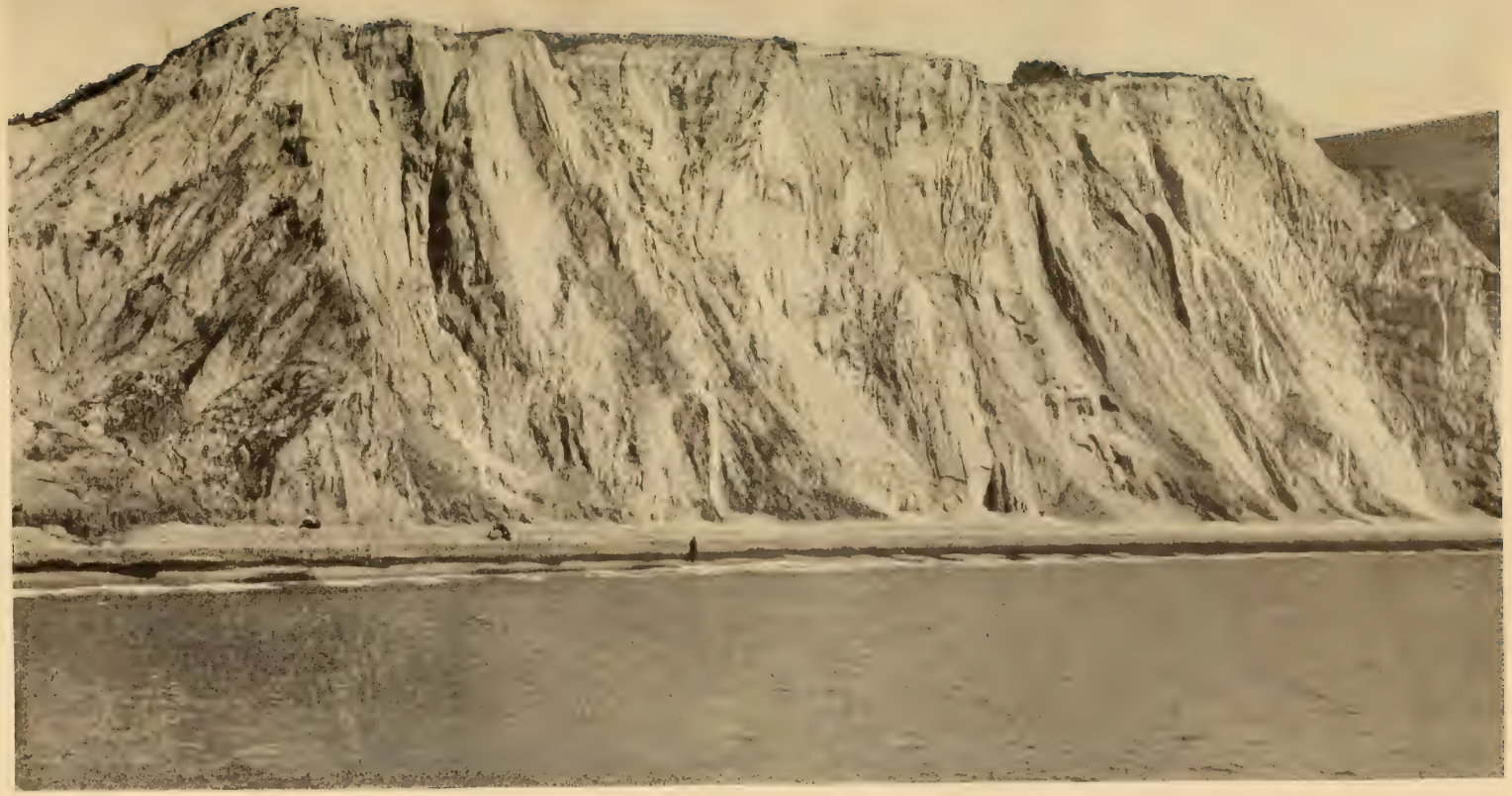


Photo by A. W. Cutler

THE MANY-COLORED CHALK CLIFFS WHICH MARK THE COAST-LINE ON THE ISLE OF WIGHT NEAR "THE NEEDLES"

These chalk cliffs are always of great interest to passengers on ocean liners plying between Southampton and New York. This is how the cliffs appear from the deck of a small pleasure steamer on Alum Bay—so called because alum years ago used to be made from this chalk. The height of these cliffs is indicated by the human figure on the beach. These chalk cliffs were formed by the deposit of tiny marine animals under water, much like coral. Upheavals finally brought them up out of the water.

Photo by Emil P. Albrecht

THE HOE, A FINE PROMENADE OVERLOOKING THE SOUND: PLYMOUTH, ENGLAND

The statue on the left is of Sir Francis Drake. Sir Francis Drake was playing bowls here on the Hoe when the Spanish Armada was sighted, but would finish his game before he went to meet it. In the distance lies Dartmoor, which has been described as a "high-lying moorland—a monstrous lump of granite covered with a sponge of peaty soil." It contains many menhirs, stone circles, and other relics of the ancient Britons (see page 37).

Photo by A. W. Cutler

"OLD DR. SYNTAX": A REMARKABLE NATURAL CURIOSITY AT LANDS END

The 10-mile drive between Penzance and Lands End is rich in history and archæology. One passes Carn Bran, where Wesley is supposed to have preached to vast crowds of miners; Boscawen, with its stone circle handed down by the ancients, and "first and last hotel in England," although it is no longer that. "Old Doctor Syntax" shares his honors with "Armed Knight" and "Irish Lady," who are also graven in stone by Nature's hand.

Photo by Emil P. Albrecht

EAST LOOE: ENGLAND

One hears many stories in Looe—stories of pirates, of war, of smuggling, of mermaids and pixies—but it is needless to say the best of all stories told in a village by the sea must be of fish. It would be pleasant to know if this one is still growing. While the men tell the stories, the women knit dark-blue jerseys; no sooner is one finished than another is begun. Looe also boasts of golf links, where the well-to-do come to play, and one knows not which are the longer, the fish caught in Looe's waters or the drives made on Looe's links, for both fisherman and golfer sometimes measure with the same elastic yardstick.

Photo by A. W. Cutler

INTO THE QUAINT CORNERS OF THE WORLD MUSIC FINDS ITS WAY

How visitors to Shanklin, Isle of Wight, are entertained each morning in the summer. In the background is Cape Dunnose

Photo by A. W. Cutler

A SCENE ON THE BEACH AT SHANKLIN: ISLE OF WIGHT

The most popular seaside resort on the island. Cape Dunnose in the background. Not far from Shanklin is the famous park of Appuldurcombe, once the estate of Sir Robert Worsley, and now the home of French Benedictine monks

Photo by A. W. Cutler

THE OLD FOUNTAIN AT THE VILLAGE OF SHANKLIN: ISLE OF WIGHT

Made famous by Longfellow, whose poems seen above refer to this fountain. Longfellow once lived in this village. Although only 65 miles in circumference, Isle of Wight, the Vectis of the Romans, is rich in history and abounds in beautiful scenery; almost half of its shore-line is occupied by villages, large and small.

HERE LIETH INTERRED
DOROTHY PENTREATH
WHO DIED IN
1777.
SAID TO HAVE BEEN THE
LAST PERSON WHO CONVERSED
IN THE ANCIENT CORNISH
THE PECULIAR LANGUAGE OF
THIS COUNTY FROM THE
EARLIEST RECORDS
TILL IT EXPIRED IN THE
EIGHTEENTH CENTURY
IN THIS PARISH OF
SAINT PAUL
THIS STONE IS ERECTED BY
THE PRINCE
LOUIS LUCIEN BONAPARTE
IN UNION WITH
THE REV? JOHN GARRETT
VICAR OF ST PAUL
JUNE 1860.
HONOUR THY FATHER AND THY MOTHER:
THAT THY DAYS MAY BE LONG UPON
THE LAND WHICH THE LORD THY GOD
GIVETH THEE. EXOD. XX. 12.
GWRA PESTHI DE TAZ HA DE-MAM:
MAL DE DYTHIOW BETHENZ HYR WAR
AN TYR NEB AN ARLETH DE DEW
RYES DEES. EXOD. XX. 12
MARTIN TEAGUE.

Photo by A. W. Cutler

A MEMORIAL TO THE LAST SURVIVOR OF THE CORNISH-SPEAKING RACE

Eighty-seven years after Dorothy Pentreath died, and with her the Cornish language from living tongue, this monument was erected to her memory by Prince Bonaparte and Vicar Garrett of St. Paul.

Photo by Emil P. Albrecht

THE NEEDLES: SOUTHAMPTON

These are jagged chalk rocks resting upon bases of darker stone rising 100 feet from the sea, a warning and a menace to mariners bound for Southampton. The cliffs form the westernmost point of the Isle of Wight. Cowes, with the best harbor on the island, is at its northernmost point, opposite Southampton and but two miles from the mainland. Ryde, farther to the east, is almost directly opposite Portsmouth, the great naval station. The island is about 65 miles in circumference and rises nearly 800 feet above the sea.

chief naval base. It is made up of four towns — Portsea, Southsea, Landport, and Portsmouth — smallest, but name-giver, and has a magnificent harbor nearly five miles long, reaching into Spithead.

PORTSMOUTH'S DOCKYARDS

The dockyard covers 300 acres, the repairing basins 60 acres, and there are drydocks and building slips capable of holding the largest superdreadnought. Southampton docks are probably in use also at present for naval purposes. Spithead and the Solent are mined; there are no crowds on the cliffs above Ryde, no yacht squadron fluttering its white sails in and out of Cowes.

In these days, when history is in the making, it seems futile to recall the past; yet one old memory will be heard even today. It was on Southampton shores that Canute rebuked the courtiers who proclaimed his command of the sea. Probably those double tides were puzzling to the Danes.

Ah, they were stirring days! Yet not more so than now. Go on round the coast, if you will, from port to port, coming finally to where Dover faces France. Ask the castle on the white cliff there what it has seen—Roman, Saxon, Dane, and Norman; how the invaders come; how, too, the white fleets go out to meet them. And now again there is war in the channel and the rocks and forts keep guard.

"Keep then the sea that is the wall of England." The cry is four centuries old; but bravely the ports, little and big, have kept the word and today would keep it still.

Photo by H. C. Tibbitts

ENTERING GOLDEN GATE

The entrance to San Francisco from the Pacific Ocean to the magnificent San Francisco Bay, about five miles in length, is through the Golden Gate, so called by the immortal Fremont, and it is a name known to seamen the world over. With its strikingly picturesque setting and splendid harbor, small wonder that San Francisco is the chief seaport of the Pacific coast and the gateway to the Orient. Its latitude is that of Lisbon and its climate like that of southern Italy

THE WONDERLAND OF CALIFORNIA

By Herman Whitaker

Author of "The Planter," "The Settler," "Cross-Trails," Etc.

FROM her earliest beginnings California was steeped in romance. Within her borders the early discoverers placed "El Dorado," the fabulous land whose shining streams rippled over boulders of solid gold, and history aided their pleasant conspiracy. For two centuries the silver-laden Spanish galleons laid their courses from the Philippines to Cape Mendocino, then skirted a thousand miles along the Californias on their way south to Panama—a fact well known to Sir Francis Drake, the gallant pirate, who laid up his vessel, the *Golden Hind,* to wait for them in a little harbor northward of San Francisco Bay.

Later came the brown-robed padres and Dons in buff and scarlet to color the land with their picturesque life and invest it with dreamy, religious idealism. If more practical, the "gold rush" of '49 was nevertheless merely the successful sequel of the search for "El Dorado," and established forever that fabled land within California's borders.

Surely, in view of all this, a heavy discount of her pretensions would seem inevitable; yet out of the full knowledge gained by 20 years' roaming within her borders I do not hesitate to assert that California is the customary exception to every rule—gains instead of depreciates on closer acquaintance.

First impressions are always vital, and one of California's principal assets inheres in the fact that, whether you come from the north, south, east, or west, she is not to be caught like a slovenly beauty, in negligée, with her stockings down at the heel.

THE LAND OF LITTLE RAIN

It would be better, of course, if you could come in by trail, as in the old days, with a white-tilted prairie schooner that pitched up and down or wallowed in the sandy trough of blue ranges that run like breaking waves across the desert from Old Mexico to the Canada line. A closer intimacy would be established between you and the country. But, seen through a car window, the desert, with its lonely mesas, monolithic masses that loom in violet distances, is beautiful beyond description—unless it be that of Mary Austin in "The Land of Little Rain."

This is the heart of it, that magic land swathed in golden sands and girded with crimson and chrome mountains that sometimes wear around their brows a cooling band of snow. From the shimmering horizon the shining wastes of the Mojave run northward across Death Valley between the high Sierras and certain broken ranges almost to the Yosemite.

It is a country useless from man's point of view, and the bones of many an adventurer testify to the fact; yet it yields a living to its own little animals and plants that burrow or sink their roots down to the water under its kiln-baked sands. Over the whitening bones snakes and lizards, horned toads, the Gila monster, coney and jack-rabbit frisk or crawl in unconscious cynicism.

They are scorned by the soaring vulture; likewise the lone coyote that stands on a sand hummock and blinks at your train. Over the shining surfaces, that reflect like huge mirrors the intolerable glare of the sun, broods a breathless calm. But this is broken, on occasion, by windpuffs that lift the alkali in sudden whorls. Always they are to be seen, these little winds, dancing over the hot face of the desert

A REGION OF YUCCA AND CACTI

Southward the desert runs to yucca, grotesque shapes that march with the train for leagues upon leagues, flinging their shrunken arms like posturing dwarfs. Elsewhere cactus chaparral clothes the nakedness of the land, and, in its season, this blossoms into sudden beauty. The yellow blooms of the *huisiche,* vermilion tips of the *okatilla,* magenta buds of the *nopal,* and "crucifixion

Photo by H. C. Tibbitts

A VIEW OF SAN FRANCISCO AND THE HILLS ACROSS THE BAY

San Francisco stands today a city that every American may well be proud of and a monument to the courage, energy, and boundless determination of its citizens. Nine short years ago, it will be remembered, the city was devastated by a fire scarcely equaled in our history. Thousands were rendered homeless and financially ruined; indeed, the nerve center of the Pacific coast business world was all but wiped out at a stroke. Yet within that short span of years the city has not only been rebuilt from its ashes—a great and glorious city of sky-scraping business blocks and palatial homes—but these same people have given to the world as a crowning achievement the Exposition of Expositions.

thorn" splash the dull green of the sage-brush with color.

But during the dry season—and that is most of the year—the sage runs, an ashen sea, to saw-toothed ranges that scratch the distant sky. If repellant at first, all of these different faces grow on acquaintance, become beautiful at last, as the smile of an old friend. Those who know the desert in its intimate moods do not altogether favor the dry farming and irrigation projects that threaten its infinite spread.

Though the desert appears dead-flat to the eye, it really runs in a series of levels, and as your train climbs from one to another, the engine gasps like a heart-broken runner and pauses often to drink at small, ramshackle towns, any one of which might have furnished the model for "Wolfville." Each fences a few rods of track from the yellow expanse, with a double row of sun-bleached shacks. Each has its Chinese restaurant and trading store, with bright Navajo rugs spread out on the veranda.

STREET LIFE

Always the street begins, ends, and is absurdly full in the middle with saloons, on the verandas of which lounge a mixed crowd of cowmen, Indians, and Mexican peons. At first sight they appear hopelessly squalid; but, like the desert, they grow on acquaintance. When viewed with the eye of knowledge, they blossom with sunset colors.

The train slides on over the edge of the desert and drops down into the sub-tropical luxuriance of southern California with a suddenness that is almost disconcerting. Through a succession of vineyards and orchards, in whose glossy depths citrus fruits glow and burn, the train runs in a couple of hours into the bright, clean city of Los Angeles.

AN HISTORIC MISSION

It now behooves one to step reverently, for this is holy ground. The Missions of San Antonio de Padua, San Luis Rey, and San Diego lie close to that city, in which the San Diego Exposition, a lovely section of Moorish Spain, is just as much at home as in its native country.

Just outside of Los Angeles stands, too, the famous old Mission of San Gabriel. Erected in 1771, it possessed in its prime four "Asestencias," one of which, the Church of Nuestra Señora la Reina de Los Angeles, was built when the proud and ambitious city was still a small Mexican hamlet, with a total population of 1,000 souls. Of the 22 missions erected by the padres, San Gabriel is perhaps the best known.

BELLS OF SAN GABRIEL

In addition to the historical associations that cluster thick around its venerable walls, it has been a favorite subject of poem and story. Stevenson wrote about it, and Charles Warren Stoddard's poem, "The Bells of San Gabriel," rings out like their rich chimes, carrying one back to the pastoral age, when the wandering tribes flocked from the woods and valleys to the mission's folds.

There could be no pleasanter trip than to follow the footsteps of the padres up the coast. You will have to go ahorse, for the way, a narrow mule path, is sometimes washed by the Pacific surf, and again it leads into the heart of the mountains. The good padres had a fine feeling for Nature, and whenever the trail slips from a mountain's shoulder into a fertile valley you will find a mission in a more or less perfect state of preservation.

Of La Purisima Concepcion there remains little more than a ruined cloister rising amidst the long grass and oaks of a hill-bound plain; but its close neighbors, San Buenaventura and Santa Barbara, are almost as good as new. Matins and vespers are still intoned in their dim chapels. You may see the soft-eyed padres walking and talking in their pleasant garden, or watch the lay brothers swinging hoe and shovel at their daily tasks.

Above San Simeon the trail disdains all commerce with other ways and runs for 90 miles under its own dignities and title of "The Old Spanish Trail." With absolute divorce from them comes also the assurety that you are following the very path blazed by Junipero Serra and used by his followers in their journey-

Photo by Pillsbury Picture Co.

THE PALACE OF FINE ARTS

As a study in color, architecture, and landscape gardening, the Panama-Pacific Exposition surpasses anything in the entire history of world's fairs. Where the Louisiana Purchase Exposition spent $3,000 an acre for landscape gardening, the Panama-Pacific spent $14,000, and if there was ever anything more beautifully gorgeous in history than the great California fair, the chronicles have failed to record it. The past and the present, the Occident and the Orient, the Northern Hemisphere and the Southern, have been ransacked for the inspirations that constitute the completed picture.

Photo by Pillsbury Picture Co.

IN THE COURT OF THE UNIVERSE, LOOKING TOWARD THE FOUNTAIN OF THE SETTING SUN AND ARCH OF THE RISING SUN

Passing through a Venetian court, the visitor emerges into the Court of the Universe, where the illumination reaches its climax in dignity, thoroughly in keeping with the grandeur of the court, where an area of more than ten acres is illuminated by two fountains rising 95 feet. A candle-power of half a million is used, and yet so wonderfully is the light directed that there is not a suggestion of disagreeable glare.

THE TOWER OF JEWELS AT NIGHT

Nothing short of genius could conceive the lighting effects of the Exposition, which were planned and executed by W. D'A. Ryan, of the General Electric Company. The gradual illumination at night is bewildering in its soft gradations of color and seems like a living page from the Arabian Nights. The reflection is in the West Lagoon of South Garden.

ings up and down the coast. Where your knee touches the worn face of a rock at a bend, there is a thrill in the thought that it was once touched by Junipero's robe.

Apart from these interesting historical associations, however, the trail is worth following for its own sake. For miles it runs like a narrow ribbon around the spurs and canyons at 1,000 feet elevation, almost perpendicular, above the blue sea. At no place is it wider than a mule's tread; wherefore pack-animals must be loaded carefully, for a scrape on the landward side has sent many a one down to its death on the surf-washed rocks below.

Next it climbs 4,000 feet to the crest of the range and lays at your feet, if not the whole world, at least a good slice of California—mountains and valleys on the one hand; on the other the vast blue sea. Then it drops again and enters the first of the redwoods; winds among pillar-like trunks in rose-brown shade, leaps silver streams, and so by wood, sea, and mountain comes presently to the Valley of the Sur, where the sunlight breaks in golden rain down through lacing alders and the river sings for you the same old song it gave to Junipero Serra.

From one thing to another, it leads on till the Carmel Mission heaves into view across a blue arm of the sea; and if you are in luck the mellow tone of a bell may come drifting across, spacing the roar of the surf, for services are sometimes held there.

HUNTING GRIZZLIES WITH STRYCHNINE

In a perfectly unfair and unkindly, yet quite natural, way, by liberal use of strychnine, the rancheros of the last generation wiped out the grizzlies. But the lynx is still plentiful. The mountain-lion quite often leaves his sign-manual in the form of a fresh-killed steer. The country abounds in deer. So many they are and hunted so little, they are very bold. Often they have followed me along the Spanish trail, and one night they came in droves to nibble fallen apples in the orchard of an abandoned farmstead where I had pitched my camp.

Trout are to be had in the streams in numbers that tempt one beyond the limit, and if you yearn for a change of fishing, a whale may be seen spouting offshore almost any day! What use you would have of him, supposing you caught him, is another question.

Sea-otter, however, is more practicable. Once in a while a pair will be seen, rolling in the surf or lying on their backs, playing with seaweed or bits of flotsam and jetsam like sportive kittens. So human they are that to kill one savors of murder; but dry salted, the skin brings from one to two thousand dollars on the market, and this goes a long way toward balancing sentimental regrets.

I suppose that Padre Serra, in the comfortable fashion of his day, spent at least a week covering the distance between Santa Barbara and Monterey. The railroad covers it in a few hours and offers second choice of route up the San Joaquin Valley, the great central valley of California. It averages from 40 to 50 miles wide and runs for 500 miles and lies, a great level lake of sunshine, between the towering, richly colored walls of the Sierra Nevada and Coast Range.

GEOGRAPHY THE SERVANT OF FICTION

Queer how closely geography is linked with fiction! Just as "Kipling" spells "India" for the majority of folks, so, by virtue of "The Octopus," Frank Norris owns the San Joaquin. Nowadays, however, he would find it hard to recognize his own, for gone, gone forever are the enormous wheat ranchos that filled the valley between the mountains with rolling seas of grain and furnished the motif for his story.

Yet the change is for the better. Chopped into a thousand vineyards and orange groves, the old ranchos now support populations of five or six thousand, where previously they gave employment to a hundred or two of nomad laborers for a short period of the year.

It is a wonderful country, this—rich, fat-soiled, laced with shining rivers that reverse the usual order of things and dwindle from good beginnings, where they issue from the Sierra canyons, into sterile river beds. Led through a thousand canals and ditches out to the thirsty

Courtesy of Southern Pacific Railway Co.

CAVE ROCK: LAKE TAHOE, CALIFORNIA

"The lake of lakes, a huge iridescent mirror, of 30 miles diameter, set in a frame of deep forests and snow-clad mountains" (see text, page 73)

Photo by George R. King

YUCCA: SIERRA MADRE, CALIFORNIA

"Southward the desert runs to yucca, grotesque shapes that march with the train for leagues upon leagues, flinging their shrunken arms like posturing dwarfs. Elsewhere cactus chaparral clothes the nakedness of the land, and, in its season, this blossoms into sudden beauty. The yellow blooms of the *huisiche,* vermilion tips of the *okatilla,* and the magenta buds of the *nopal* . . splash the dull green of the sage-brush with color" (see text, page 57)

Photo by H. C. Tibbitts

THE HIGH SIERRAS FROM THE SUMMIT OF CENTRAL DOME, YOSEMITE PARK

"A few hours' ride on horseback brings one to the top of the canyon walls, from whence can be seen, one-half mile below, the quaint mountain village nestling at the base of the cliff, over which pours a roaring, snow-white river. Looking to the east, miles upon miles of ragged, sawtooth crest of the Sierra Nevada are clearly visible, with its great snowbanks and glaciers"

land, their waters are transmuted by the sun's secret chemistry into olives and figs, peaches and nectarines, citrus fruits, nuts, raisins, dried fruits; amber wines clear as the Sierra air; a wealth of produce that justifies a report similar to that which the Israelite spies brought from the Land of Canaan—"a land flowing with milk and honey."

THE VALLEY OF HEAVEN

From the town of Merced, midway of the valley, a branch railway runs up the river of the same name to California's crowning glory, the Yosemite National Park. Lacking the immensity of the Grand Canyon of Arizona, it is still one of the world's greatest gorges. From the edge of beautiful forests you overlook 7 miles of the canyon, that averages in width from a half mile to a mile and is hewn a mile deep in the solid granite of the range.

Many books have been written about the Yosemite and the companion valley, Hetch-Hetchy. Some are wonderful books—great books like those of John Muir—which communicate as much as may be conveyed through words of the grandeur of its vistas, nobility of its granite spires and domes, beauty of the lacy falls that leap from the rim into the depths beneath. Yet when all is told the wonder and mystery of Yosemite still remain unfolded. The feeling it inspires lies in the domain of the "incommunicable," that thrills, but lies beyond the province of words. It has to be seen to be felt.

Muir writes of it: "No temple made with hands can compare with Yosemite. Every rock in its walls seems to glow with life. Some lean back in majestic repose; others absolutely sheer, or nearly so, for thousands of feet, advance beyond their companions in thoughtful attitudes. . . . Awful in stern, immovable majesty, how softly these rocks are adorned, and how fine and reassuring the company they keep; their feet among beautiful groves and meadows, their brows in the sky, a thousand flowers leaning confidingly against their feet, bathed in floods of water, floods of light, while the snow and waterfalls, the winds and avalanches and clouds shine and sing and wreathe them about as the years go by, and myriads of small winged creatures—birds, bees, butterflies—give glad animation and fill the air with music.

"Down through the middle flows the crystal Merced, River of Mercy, peacefully quiet, reflecting lilies and trees and the onlooking rocks; things frail and fleeting and types of endurance meeting and blending in countless forms, as if into this one mountain mansion Nature had gathered her choicest treasures to draw her lovers into close and confiding communion with her."

Yet, wonderful as it is, Yosemite is still but one of a hundred—aye, a thousand—canyons, great gorges from two to five thousand feet deep, great streets of the mountains.

THE MONARCHS OF THE TREE KINGDOM

This, too, is the country of the big tree, *Sequoia gigantea*, the king of all forests. Within 20 miles of Yosemite stand three great groves—Merced, Mariposa, and Tuolumne. Below Kings River, however, redwood forests run unbroken for nearly 70 miles; and they are also to be found in scattered tracts along the coast and in the interior, running northward for about 300 miles.

Here, as with Yosemite, words fail in the attempt to convey an adequate impression of these noble trees. As old as the Pyramids, taller than man's greatest monuments, and more enduring, they rise in serene majesty above the lower forests. In the Calaveras grove four trees exceed 300 feet in height.

John Muir once measured a fallen monarch that ran 340 feet over all and was 35 feet 8 inches in diameter 4 feet above the ground. A count of the rings proved it to be 4,000 years old. It was indeed, in its prime, a noble tree, 27 feet in diameter at the beginning of the Christian era.

A curious thing about the big tree inheres in the fact that it keeps an accurate chart of the pulsations of climate. In wet seasons it naturally adds a larger rim to its growth, and so, by their measurement, a weather curve may be plotted back through the ages.

Photo by H. C. Tibbitts

HALF DOME FROM GLACIER POINT

"Awful in stern, immovable majesty, how softly these rocks are adorned, and how fine and reassuring the company they keep; their feet among beautiful groves and meadows, their brows in the sky, a thousand flowers leaning confidingly against their feet, bathe in floods of water, floods of light, while the snow and waterfalls, the winds and avalanches and clouds shine and sing and wreathe them about as the years go by, and myriads of small winged creatures—birds, bees, butterflies—give glad animation and fill the air with music!" (see text, page 67).

Photo by H. C. Tibbitts

CLOISTER AISLE: CALIFORNIA STATE REDWOOD PARK, NEAR BOULDER CREEK, CALIFORNIA

If the groves were God's first temples, the giant redwood forests of California are His greatest. "Here, as with Yosemite, words fail in the attempt to convey an adequate impression of these noble trees. As old as the Pyramids, taller than man's greatest monuments, and more enduring, they rise in serene majesty above the lowest forest. In the Calaveras Grove four trees exceed 300 feet in height. John Muir once measured a fallen monarch that ran 340 feet over all and was 35 feet 8 inches in diameter at a point 4 feet above the ground. A count of its rings proved it to be 4,000 years old" (see text, page 67).

THE GROUNDS OF PALMDALE MISSION: SAN JOSÉ, CALIFORNIA

"There could be no pleasanter trip than to follow the footsteps of the padres up the coast. You will have to go ahorse, for the way, a narrow mule path, is sometimes washed by the Pacific surf, and again it leads into the heart of the mountains. The good padres had a fine feeling for nature, and whenever the trail slips from a mountain's shoulder into a fertile valley, you will find a mission in a more or less perfect state of preservation" (see text, page 59).

Photo by George R. King

MONTEREY COAST: CALIFORNIA

"Arcady lies just over yonder, and by that Castilian font Pan pipes as of old, calling his subjects to play. Care cannot follow into those wild-woods; once buried in the immensity of Nature's breast, men and women, children all, find surcease from every sorrow, 'the world forgetting and by the world forgot.'"—GILBERT.

THE KAWEAH CANYON FROM DEER CREEK TRAIL TO KERN RIVER CANYON: CALIFORNIA

"Next it climbs 4,000 feet to the crest of the range and lays at your feet, if not the whole world, at least a good slice of California—mountains and valleys on the one hand; on the other the vast blue sea. Then it drops again and enters the first of the redwoods; winds among pillar-like trunks in rose-brown shades, leaps silver streams, and so by wood, sea, and mountain comes presently to the Valley of the Sur, where the sunlight breaks in golden rain down through lacing alders, and the river sings for you the same old song it gave to Junipero Serra" (see page 63).

TREE MEMORY MORE ACCURATE THAN MAN'S

We are told, for instance, that a prolonged drouth afflicted Israel during the reign of the wicked King Ahab; and, proving at once the truth of the Biblical record and the universality of the weather, the drouth is found strongly marked by an attenuated ring in the larger trees.

It has been said that the Sequoia is dying out; but expert testimony proves that it is not only producing bountifully over large areas, but also that the young growths win out in the struggle for existence with the pine and fir around them. Over them, too, it possesses an inestimable advantage—it is indestructible by fire or insect plagues and, apparently, has no diseases. Barring accident, it is immortal, and as California has awakened at last to her duty in the preservation of these noble trees, it would seem that they are destined to remain forever towering monuments in her list of glories.

Northward of Yosemite, among the glaciers and snow-clad peaks of the Sierras, the railroad lines enter California through mountain portals. By one you come to Tahoe, the lake of lakes, a huge iridescent mirror of 30 miles diameter, set in a frame of deep forests and snow-topped mountains. Another runs down the Feather River Canyon, that wonderful street of the mountains that leads by tumbling waters, lacy, silver cascades, to the warm plains beneath.

From both, views are obtained—views on views, constantly changing, increasingly beautiful, that have no superiors in the mountain scenery of the world. Or you may drop down through the northern portals of the Siskiyou Range past Mount Shasta's great white cone and pass through deep woods to the Sacramento River and follow its stream to its confluence with San Francisco Bay.

MAKING THE PEOPLE'S PLAYGROUNDS AVAILABLE

The Secretary of the Interior, Franklin K. Lane, is carrying to completion the new policy inaugurated in establishing permanent camps within the national parks, which will afford a high degree of practical comfort and utility to all who come, and at such a minimum cost that thousands can now take advantage of the opportunity offered to spend healthful vacations in this wonderland of nature, which heretofore has been prohibitive to many because of the expense. It is proposed to equip all of the large national parks in this way with model camps, so that individuals or parties can live under canvas close to nature, yet safeguarded and assisted in every way by government supervision.

Drop from the cars at any place and you will find yourself in fisherman's or hunter's country. Rainbow trout swarm in the mountain and hill streams. Striped bass that run to 30 pounds—no better fighting fish in any waters—abound in the river deltas. Black bass, of both small- and large-mouthed varieties, are fished for in San Francisco Bay.

Salmon are best at Monterey, and for tuna—which run up to 300 pounds—you go to Catalina Island. Steelheads afford splendid sport in the river deltas during January. Catfish, perch, carp, and salmon trout are found in all streams.

It is also a hunter's paradise. Nowhere will you find better duck shooting than in the Suisun marshes or the great tule swamps around San Francisco Bay. Grouse, quail, and wood pheasants are found everywhere, even in the suburbs of some towns. Bears, the mountain-lion, lynx, and coyote are easily found, and the country, as before said, is full of deer. So, be your sport what it may, California, somewhere in her environs, will give it full play.

A BEAUTIFUL WELCOME ON EVERY SIDE

North, south, east—entered by any of these portals, California is equally fair. There remains the west, and if I be given my choice, let me come in from the sea. The eastern visitor who journeys to the Exposition by water through the canal or by any of the scenic routes will choose wisely and well. If by water, during lazy, somnolent days he will have watched the shore, with its palm-fringed beaches, lace of breaking surf, slip by as in a dream; and when California heaves in sight, seen through a silver haze, the

Photo by Pillsbury Picture Co.

BRIDAL VEIL FALLS: MERCED RIVER

"Down through the middle flows the crystal Merced, River of Mercy, peacefully quiet, reflecting lilies and trees and the onlooking rocks; things frail and fleeting and types of endurance meeting and blending in countless forms as if into this one mountain mansion Nature had gathered her choicest treasures to draw her lovers into close and confiding communion with her" (see text, page 67).

Photo by H. C. Tibbitts

MT. SHASTA FROM MT. WILSON

California is the second largest State in the Union. Joined with Texas, it would have a larger area than France and Germany together. In Mt. Whitney it has the highest elevation in the United States outside of Alaska, and in Death Valley the lowest area; in the Salton Sink it possesses the hottest weather in the country, and on Mt. Whitney and Mt. Shasta perhaps the coldest; in its southern desert it has the least rainfall, and in its northwestern coast counties almost the maximum rainfall of the country.

golden coast exactly matches the poems of Joaquin Miller and tales of Bret Harte. Its wonder and mystery loom in those distant mountains. Any fortune might be hidden behind their barriers.

Every point and inlet—San Diego, San Pedro, San Luis Obispo, Arguello, Concepcion—recall the padres and bearded Dons. Sir Francis Drake, in company with two centuries of Spanish navigators, missed the Golden Gate. But times have changed, and today one can sail on a splendid ocean liner from New York through the Panama Canal to the Golden Gate in 17 happy days. Slipping through the heads one morning, should you come by water, you come suddenly upon a sight that causes you to rub your eyes and look again to make certain that it is not a page from the "Arabian Nights."

CAN THINGS UNRIVALED BE PICTURED IN WORDS?

How shall one describe it, this wonderful city that is a fitting setting for the crowning jewel of all the expositions. A walled town of the Orient, its green and golden domes, mosaic towers, sculptures, arches, and old ivory façades loom in shimmering mists of color. The basic colors are blue and gold—the gold of California's hills, blue of her sunny skies—and these were chosen wisely, for they belong to the Orient, where violent color is quickly toned by the sun to soft pastel shades.

The pale greens are those of ice. Those swelling green domes might have been quarried from Sierra glaciers, the gold from California's mines. The limestone ranges of Monterey lay just such façades along the sea.

The Mojave Desert inspired the ambers and those pale golds. Bound into a whole by the spell of color, the Exposition sits, indeed, like a great gem in its setting of street-crowned hills. Whether seen from above or viewed from the sea, the first effect is the same—of beauty, elusive, mysterious, aloof.

Very fittingly, the California Host Building, which rambles in the happy mission fashion over five broad acres, stands on the "Marina," a beautiful esplanade that runs for a couple of miles along the Golden Gate. Low and wide in the main, it rises in the center to upper stories with bell towers surmounting a chapel front that carries, somehow, a suggestion of the desert pueblos.

YESTERDAY AND TODAY

Its back wall is almost washed by the tides—the same tides that brought Fathers Cambon and Palou ashore in the boat of the *San Carlos* to establish the *presidio* and mission of St. Francis de Assisi two centuries ago. What a difference between this superb building and the block-houses and log chapel within a stockade they erected on this very spot! Yet it is the lineal descendant of the solid structures they erected later. Junipero Serra would have delighted in this building. One almost looks to see him, with his friend and faithful lieutenant, Palou, pacing the cloisters that surround a flowering patio.

The eight exhibition palaces are commodiously arranged in a vast quadrangle that is situated between two great avenues and bisected down its length by a central avenue which is stopped at each end respectively by the gigantic Hall of Machinery and the Palace of Fine Arts. Looking down this central axis from the south end, the eye beholds a vision of courts and connecting Venetian gardens, court after court, seen through gigantic arches crowned with heroic groups, and stopped over half a mile away by the lovely Palace of Fine Arts.

THE AWE OF PERFECT BEAUTY

The vision excludes, at first, all else from the mind but the awe inspired by perfect beauty; and when it is ready to take cognizance of other things, the next great impression is of the surpassing fitness, perfect coincidence of the event and the place. If you came by water, the long white wake of the ship down the Pacific to the canal remains fresh in your memory. If you came overland by any of the splendid scenic routes, then, seen through great arches, frequent glimpses of the Golden Gate compel perpetual recognition of the great economic fact behind all this beauty—the opening of the Panama Canal.

Photo by Gabriel Moulin

A TYPICAL GARDEN IN PIEDMONT, ACROSS THE BAY

No garden of Eden could be richer in flowers than are the cities across the bay from San Francisco, and there can be found no greater civic pride than is displayed by the residents. Every home, be it rich or poor, has its burst of bloom, and even the streets in the residential sections are veritable rose gardens.

Courtesy of Southern Pacific Railway Co.

A BIG TREE AND A LONG TRAIN IN CALIFORNIA

Nowhere else in the world do such massive living things exist as the big trees in the State of California. Not only are they the greatest of all living things in bulk, but they are the oldest. They had begun their existence on earth before Joseph appeared at the Court of Pharaoh and interpreted the dream of the lean kine and the fat. From that time forward they have written their record of the lean years and of the fat ones of the world's history.

In other ways it is kept, too, in the forefront of your mind. The motifs of sculpture, mural paintings, and decorations lead up through historical sequences that begin with the voyage of Leif Ericson and his Norsemen to the coast of Maine, follows the Spanish conquest and Anglo-Saxon progression westward to the culmination in the heroic groups of the "Eastern and Western Nations" that crown the lateral arches in the "Court of the Universe."

The most remarkable phenomenon in commercial history is and has been the slow progression of the economic power westward from its ancient source in the East. Through Asia and Europe it slowly passed, each principal nation holding it for its little hour before it crossed the Atlantic to us. From the beginning of time this movement proceeded steadily toward the culmination prophesied in a verse of Whitman's that is hewn on the face of the western arch beneath the pioneer group:

> FACING WEST FROM CALIFORNIA'S SHORES,
> INQUIRING, TIRELESS SEEKING WHAT IS YET UNKNOWN, I, A CHILD VERY OLD, OVER WAVES TOWARD THE HOUSE OF MATERNITY, THE LAND OF MIGRATIONS, LOOK AFAR—
> LOOK OFF THE SHORES OF MY WESTERN SEA, THE CIRCLE ALMOST CIRCLED.

PROPHECY FU[illegible]

That prophecy is no [illegible] commercial dominion, it is [illegible], now rests with us, and, thanks to the impetus that is certain to result from the European war, will attain power and importance under us such as the world has never seen before. But, flowing on still west-

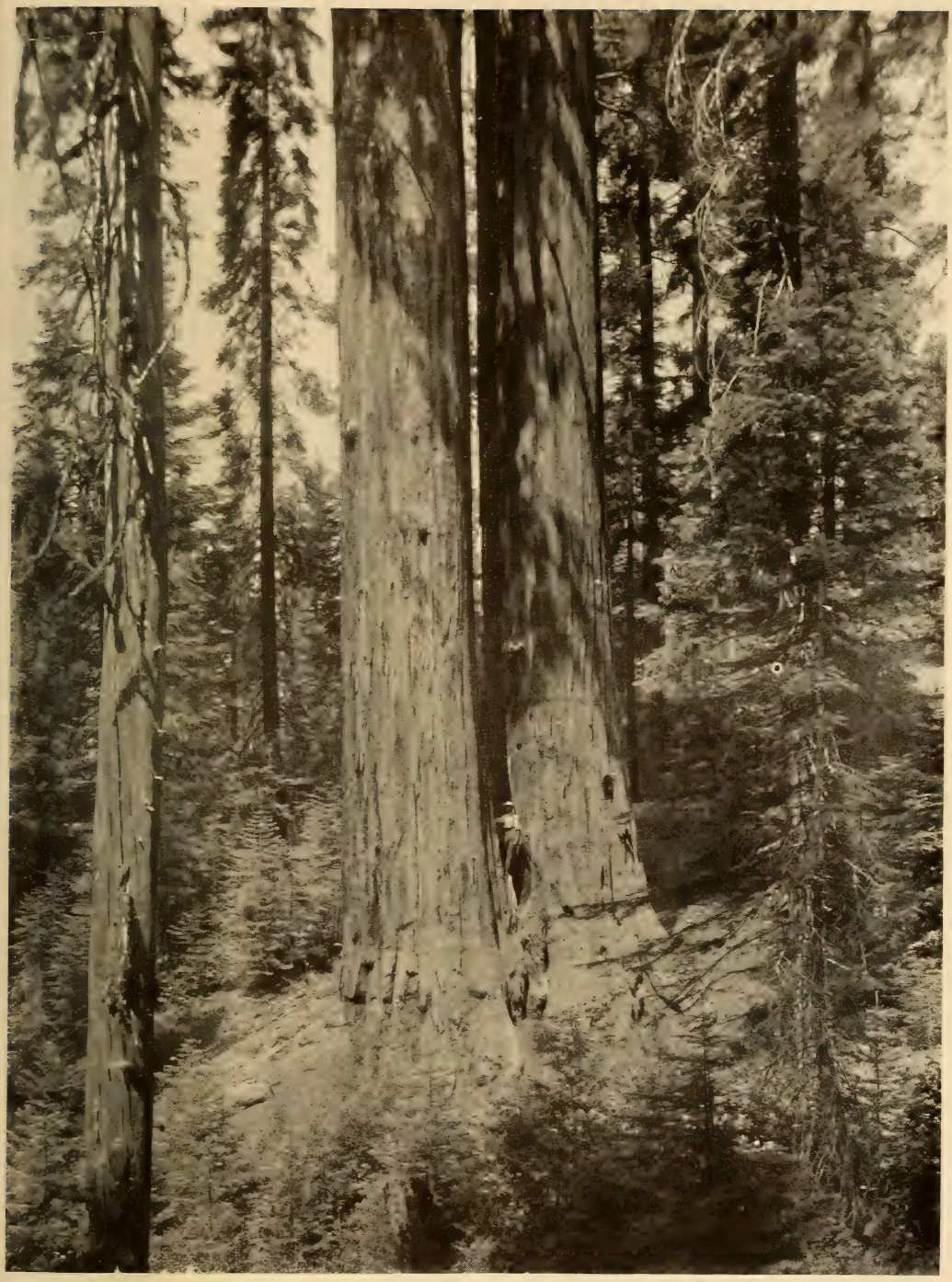


Photo by George R. King

THE TWINS: TUOLUMNE GROVE, CALIFORNIA

It is a remarkable fact that the most accurate record of the world's weather, during the past 4,000 years, which we have is written by the trees. The patient comparisons by means of delicate measuring instruments, which have been made by forest experts, reveal the fact that the records written in the past quarter of a century by the United States Weather Bureau and by the big trees of California tell exactly the same story. We are therefore permitted by an examination of the rings of the centuries that have gone before to read of the years of abundance and famine in the land. The "oldest inhabitant" may declare that the winters were once colder and the summers once hotter than now; that there was more rainfall in the older days than now; but the big tree's memory is never at fault.

Photo by Pillsbury Picture Co.

GRIZZLY GIANT TREE: MARIPOSA GROVE

"It has been said that the sequoia is dying out; but expert testimony proves that it is not only producing bountifully over large areas, but also that the young growths win out in a struggle for existence with the pine and fir around them" (see text, page 73).

ward, Occidental civilization has inundated the Orient, and now comes the backwash—first, in the form of national exhibits from Japan and China that exceed in value those of any other principal power; second, in a fast-growing commerce, the visible signs of which—the great liners of the Toyo Kisen Kaisha and big, black freighters—are to be seen heaving in and out of sight from this court at any hour of the day.

Without the canal the natural expansion of trade with the Orient would have done great things both for California and the entire Pacific coast; but its opening has caused an acceleration that is without parallel in history. In three months the trade of San Francisco with Europe increased 100 per cent; with New York and Atlantic ports it rose 260 per cent; and whereas only three main lines of steamships used the port previously to the opening, 16 main lines have now established regular sailings; and though every month brings still more lines, their accommodations are insufficient for the cargoes offered. Single vessels have left as much as 2,000 tons on the wharves.

WORLD'S NOBLEST MARINE VIEW

It would almost seem that when Nature lifted a spadeful out of the Coast range and inundated a thousand square miles of valley to form the largest harbor in the world she had in view the present situation. Seen from any of San Francisco's principal hills, the harbor presents one of the world's noblest marine views.

Directly opposite, Berkeley, Oakland, Alameda, and Piedmont, the bay cities, doze in the heat haze within a cradle of tawny hills. Alcatraz Island and Yerba Buena loom in the foreground through a drift of mist. All along the water front and far up the bay, tugs and fat-bodied ferry-boats, liners from the Orient, tramp steamers in from the canal, blunt-nosed scows and the stern-wheel river boats, lay a lace of white across the blue.

From the wharves that thrust stubby fingers into the stream uprises a forest of masts. A glass would show a second forest in the still waters of the Oakland harbor. The whirr and rattle of winches, stevedores' whistles, hysteria of a pile-driver, clangor of bells and sirens punc-

tuate the dull roar of the world traffic in course below.

A busy as well as a lively scene, it is nevertheless merely a faint indication of that which the future holds in store. On the Oakland side half a dozen sea-walls already thrust long stone fingers miles into the bay, and between them powerful suction dredges are filling in the flats. Ten miles of water front are in course of preparation for docks and wharves to care for the increased trade, and there is no limit.

If necessary, a hundred miles of water front could be developed around the bay, with close connections between ship and rail; and some day it *will* be needed. When the war is over and the stream of European immigration is diverted from the Atlantic seaboard through the canal into the wide, empty spaces of the Pacific coast; when these begin to yield corn, and olives, and oil, and wine instead of chaparral; when a thousand new towns and cities shall multiply the demand for manufactures; when mills, and mines, and factories, and new industries of a dozen sorts spring up all over the land, and more and more lines of steamships radiate from San Francisco all over the western world; then, wide as are its waters, this beautiful harbor will be black with shipping as a northern lake on the return in spring of the waterfowl.

A WORLD EMPIRE

A hundred ships will lie at anchor where one now dots the shining expanse. In these pleasant climes, where snow is a phenomenon and there is no winter cold to chill man's energies and consume his summer earnings, where the earth yields more abundantly and variously of her fruits and grains, with the backwash from the Orient lifting trade to its highest levels, will undoubtedly arise one of the world's greatest commercial empires.

It is wonderful as it stands today—the more wonderful when one contemplates the complete ruin which overwhelmed San Francisco less than ten years ago. Sitting on a fire-swept hilltop, in the midst of 27 square miles of ruins, nine years ago, I penned the following dispatch for a New York periodical:

Photo by Pillsbury Picture Co.

THE ROAD WINDS AMONG THE GIANT REDWOODS

"Over the pine and the fir the sequoia possesses an inestimable advantage. It is indestructible by fire or insect plagues and, apparently, has no diseases. It would seem that they are destined to remain forever towering monuments in California's list of glories" (see text, page 73).

Photo by John Oliver La Gorce

OVERHANGING ROCK: YOSEMITE VALLEY

A remarkable rock reaching out over the side of Glacier Point, from which one can look down upon the floor of the valley, nearly a mile and a half below. Note the guides grouped on the edge.

Photo by Lucie King Harris

YOSEMITE FALLS

The view of the great cataract from the Yosemite Falls Camp at its foot is one of surpassing beauty and never-to-be-forgotten delight. In its three flights—the first being a vertical leap of 1,400 feet, the second 600 feet, and the third 400 feet—Yosemite drops nearly half a mile, and at the point of its upper discharge is but 35 feet in width. Compared with Niagara's drop of but 170 feet, its lofty leap can be better appreciated.

Photo by Harriet Chalmers Adams

VERNAL FALLS: YOSEMITE NATIONAL PARK, CALIFORNIA

"No temple made with hands can compare with the Yosemite. Every rock in its walls seems to glow with life. Some lean back in majestic repose; others absolutely sheer, or equally so, for thousands of feet, advance beyond their companions in thoughtful attitudes" (see text, page 67).

"Of its kind it is undoubtedly the most stupendous catastrophe in all history, and when that is said not the half is told. Now that the smoke pall is lifting, one looks over a ruin so vast and complete that the mind, refusing to grasp it for lack of contrast, registers an impression of the commonplace. When, after hours of wandering amid calcined brick piles one returns to Oakland across the bay, its flowers and gardens appear foreign and strange San Francisco is a huge lime-kiln; its streets elevated causeways that run through charred and blackened cellars."

Compare that complete ruin with what one sees from the same viewpoint today: a larger, fairer, nobler city that lays her parks and squares, temples, skyscrapers, residences, a flexible mantle of brick and stone, across a dozen hills; add the Exposition, a work that cost over 50 million dollars, and you have a monument to the pluck and perseverance of the manhood of San Francisco such as will never be surpassed.

MANY SPIRITS BECOME ONE

It has been said of San Francisco that it is not a city, but a spirit. It might be added that this is the spirit of California, the indomitable spirit of '49 plus the best qualities of a dozen races added since—Spanish warmth of love and its ease, a Latin penchant for music and the arts, the imperturbability of the Orient, Scandinavian faithfulness, and so on—all these she has, a wonderful combination fused in a flame that cannot be quenched by adversity.

So varied is she in her likings, pleasures, and occupations that it is impossible to reduce even her essences to the limits of these paragraphs. Situated on a peninsula with towering hills, washed on three sides by the sea, her wants supplied by the most fruitful country on earth, it would be a matter of wonder if she were not something of a Hedonist.

Good-humored, kind, hospitable to the echo, your San Franciscan rather prefers to get all he can out of life now and take his chance with the hereafter. Something of a gourmand, he is quite universal in his tastes. The cooks of all lands cater to his needs and cater better than they ever did at home. In San Francisco you can eat a better French, Mexican, or Italian dinner, served at lower prices, with better service, than in Paris, Mexico City, or Rome.

The Latin blood, of which a generous strain now runs in its veins, calls insistently for music, and San Francisco was for a long time the only city in America where grand opera could run all the year round. The climate makes against reading. It takes a long winter to produce students. But if the San Franciscan leaves books largely to his wife and daughter, he is nevertheless thoroughly Grecian in his love of beauty and subscribes liberally to the arts.

THE CALIFORNIAN'S PHILOSOPHY

One might sum his liberal philosophy: to be a staunch friend, a good neighbor; to live well and broadly; to love beauty in all its forms. Nothing ascetic about it; nothing highfaluting, but broad and kindly, thoroughly Californian.

On his business side, the San Franciscan is equally broad. Though he no longer goes to business in a frock coat and stove-pipe hat, as in Bret Harte's day, he is still very much of an adventurer, ready to take a chance, whether it be salvage on a wreck, the financing of a South American revolution, or a "grub-stake" for a prospector on a still hunt for a lost mine, and withal most sound in his business principles. It is in his blood; for he was born within sound of the Pacific, whose surf thunders of romance; he breathes the breath of the "trades" that sweep in from the isles of the southern seas. And examine his lineage! This old gentleman you meet on the street may be a bit tottering about the knees, but the frank, strong soul of him looks out of eyes that are clear, free, and fearless as those of "Tennessee" and his "bearded pards."

The latter genus, by the way, is not quite extinct. Sometimes in out-of-the-way places you will meet a specimen, beard white over his rough shirt, but hale and hearty; eyes bits of blue agate—free, fearless, innocent as of yore. If not recently converted to "oil," his talk still

runs in "prospects," and calls up, as he runs along, vivid pictures of sun-struck canyons and sudden odors of sage and chaparral.

AH SING AND HIS DAUGHTER

He still looks with huge disfavor upon Ah Sing, flapping in loose cloth shoes along Chinatown's narrow alleys. In his time he gave poor Ah the devil's own time of it, hunting him with the same venom his grandson displays to the Jap.

Time, however, brings its surceases. The best of servants, most faithful of friends, a true gentleman in his quiet reservations, the Chinaman has won a permanent place in California's life. Forty thousand of him — save for the "tong wars," during which he practices race suicide with a hatchet—live at peace in San Francisco; also he has lived down the reputation for "tricks that are vain" foisted upon him by Bret Harte. His word passes everywhere for his bond.

His daughter, little Miss Ah, is a living proof of his complete patriation. That which it has done for little Miss San Francisco, developing her into the loveliest creature in all the world, the climate has also done for little Miss Ah. She is twice as tall and ten times as pretty as her sallow, short-footed slave mother. Slim and delicately colored by nature—helped out a bit, perhaps, by a rabbit's foot—she is to be seen any day in bevies of three or more, happy and free, full of giggles and chatter, lending the color of her blue, cerise, or mauve pantaloons to the duller costumes on Market Street. Yet so much has she become a part of San Francisco's life that none but a tenderfoot stares at her.

And that which climate has done for Miss Ah it is also doing for higher things, promoting greater loveliness in music, painting, sculpture, letters, all the arts. It is trite, now, to draw the parallel between California and ancient Greece, yet the causes which made the latter are already at work to develop in the former a like sensitiveness to the beautiful. The cold northlands were always the mother of great deeds. First in conquest, later in the inventions that make for material well-being, they led the world. But while their children were still chanting their boisterous sagas to the clashing of shields, the cadences of real song, rhythms of true poetry, were rising and falling in the southlands in harmony with the surge and recession of Mediterranean waves.

That climate is the mother of art, then, there can be no doubt. In a pleasant land, where neither tweaking cold nor enervating heat chill or enervate the mind, it will inevitably make its highest flights, and those ideal conditions which made the Mediterranean the cradle of the arts are duplicated in California. From the virile sowing of pioneer seed which, as under the breath of a mighty wind, was brought in from the four quarters of the world by the "gold rush" of '49, has already issued a crop of great writers and poets.

A LONG LIST OF AUTHORS

First, Joaquin Miller, Ina Coolbrith, Bret Harte, Charles Warren Stoddard, Edwin Markham, each celebrating in his or her own inimitable way the spread of desert or mountain, misty canyons, cathedral redwoods, oak-studded meads and riven valleys, bound in between the snow-capped Sierras and vast blue spread of the sea.

After them came a second crop—Frank Norris and Jack London, Mary Austin, George Sterling, John Fleming Wilson, James Hopper, Gertrude Atherton—and upon their heels now comes treading a greater host—poets, painters, writers, actors, playwrights, good craftsmen—all who would have stood out as notable figures in the less crowded fields of 20 years ago. And with such a beginning, what can be the end—but the creation of a second Greece?

The Exposition, with its warm color, great spaces, and huge masses rising from the ruins of a burned city, is at once a product and manifestation of this later Grecian spirit. Where else could its colorful beauty have been so perfectly at home, after granting the spirit to produce it? It is true that it has been called into existence only to serve the need of an hour; but that merely increases the wonder of it!

Photo by H. C. Tibbitts

"MAID OF THE MIST": NEVADA FALL, YOSEMITE VALLEY

"The Sierra Nevada range of mountains, from Mt. Whitney to Mt. Shasta, is replete with scenery such as people of all countries travel thousands of miles to visit. There are in this range of mountains the deepest canyons in the world, the oldest living thing in the world, the highest waterfalls in the world, the highest point of land in the United States, and in addition to all of these marvels and wonders the entire range is a riot of exquisite landscape beauty, wild flowers, forest glades, and Alpine lakes."

Photo by Prof. Ferdinand Ellerson

A SEA FOG IN CALIFORNIA

Nothing can be more magnificent or inspiring than to stand upon the summit of some mountain of the high Sierras and look out over a valley filled with fog; to see the vast rolling billows of mist resembling an ocean lashed to fury by a storm, below your feet, and the clear blue sky over your head; and sometimes even to behold the lightning and to hear the thunder's peal amid the clouds below. It is an experience that no one who has felt its thrill can forget.

Photo by Pillsbury Picture Co.

ROYAL ARCHES AND HALF DOME: WINTER IN YOSEMITE VALLEY

"The Yosemite National Park has been justly called the incomparable. It was set aside October 3, 1890, and contains three-quarters of a million acres. No equal area in the world possesses so many wonders of Nature, so many magnificent scenes, or such glorious growth of flowers and forest trees."

Photo by Pillsbury Picture Co.

ARCHWAY: SAN FERNANDO MISSION

"Of La Purisima Concepcion there remains little more than a ruined cloister rising amidst the long grass and oaks of a hill-bound plain; but its close neighbors, San Buenaventura and Santa Barbara, are almost as good as new. Matins and vespers are still intoned in their dim chapels. You may see the soft-eyed padres walking and talking in their pleasant garden, or watch the lay brothers swinging hoe and shovel at their daily tasks" (see text, page 59).

Photo by Pillsbury Picture Co.

WAVES AND ROCKS: POINT LOBOS, MONTEREY

Californians have christened their State "The Playground of the World," and whoever goes there comes away feeling that civic pride has not overpainted the picture. Rugged seacoast, delightful beach, Eden-like valley, snow-capped mountain, desert-afflicted plain, pellucid lake, roaring cataract, the tallest tree, the sweetest flower—what can there be that California does not offer?

Photo by Pillsbury Picture Co.

MIDWAY POINT: MONTEREY

"Again and again in California great Nature, the mystic world-mother, has sounded the note sublime. Seashore, desert, mountain, giant tree, strange valley, towering cliff—all have been staged for a world spectacle, a drama of magnificence."—EDWIN MARKHAM.

Photo by John Oliver La Gorce

EL CAPITAN: "THE ROCK OF AGES"

Known the world over, this mountain of granite, with its sheer face of 3,000 feet, has withstood the warring elements since the Ice Age because of its exceptional solidity

Photo by W. L. Huber

SIERRA NEVADA MOUNTAINS, NEAR DEVIL'S POST PILE NATIONAL MONUMENT: CALIFORNIA

From Mt. San Jacinto to Mt. Shasta, the California Sierra Nevadas cover 600 miles, their frozen summits towering to heights of 15,000 feet. Mt. Ritter (center), 13,156 feet; Banner Peak (right), 12,957 feet

MT. SHASTA: CALIFORNIA

Photo by Charles F. Holder

This culminating crown of the united Coast and Sierra Ranges marked for generations the boundary line between the French possessions on the north and the Spanish on the south. According to Indian legend, the Creator made Mt. Shasta the first of all the mountains, as His masterpiece, with which, as a model, He designed the other mountains of the world.

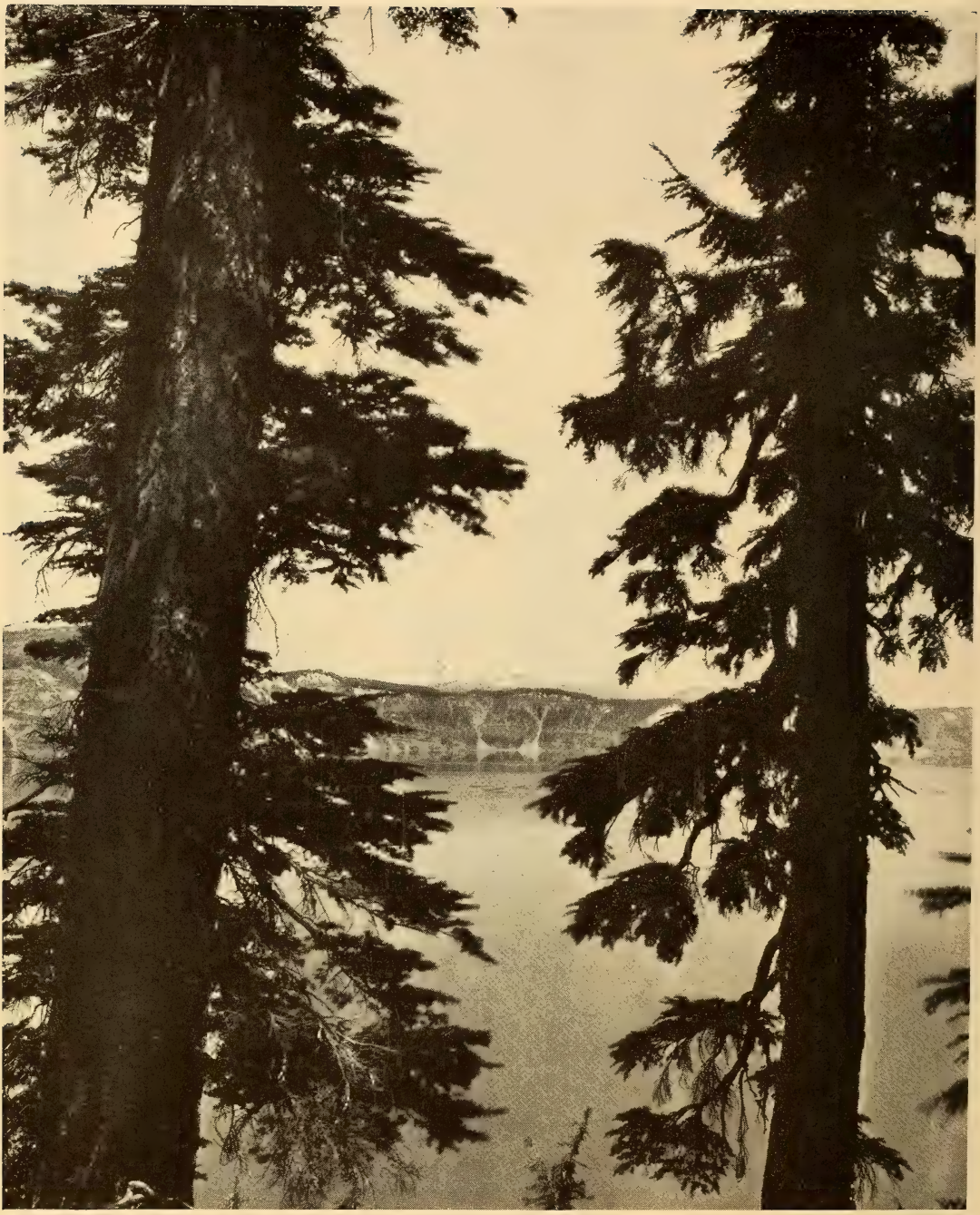


Photo by George R. King

A GLIMPSE THROUGH TREES: CRATER LAKE NATIONAL PARK, OREGON

Lying crystal-cold in a basin formed by a partly destroyed volcano, Crater Lake, 6,200 feet above the sea, completely surrounded by a varying line of cliffs between 500 and 2,000 feet in height, is a chief gem in the crown of the Cascade Mountains. The lake is about 20 miles in circumference, and the wild freshness of its nature makes it a peer of those Alpine lakes whose names and fame have traveled so widely through the world—better advertised, but not more fascinating.

Photo by Pillsbury Picture Co.

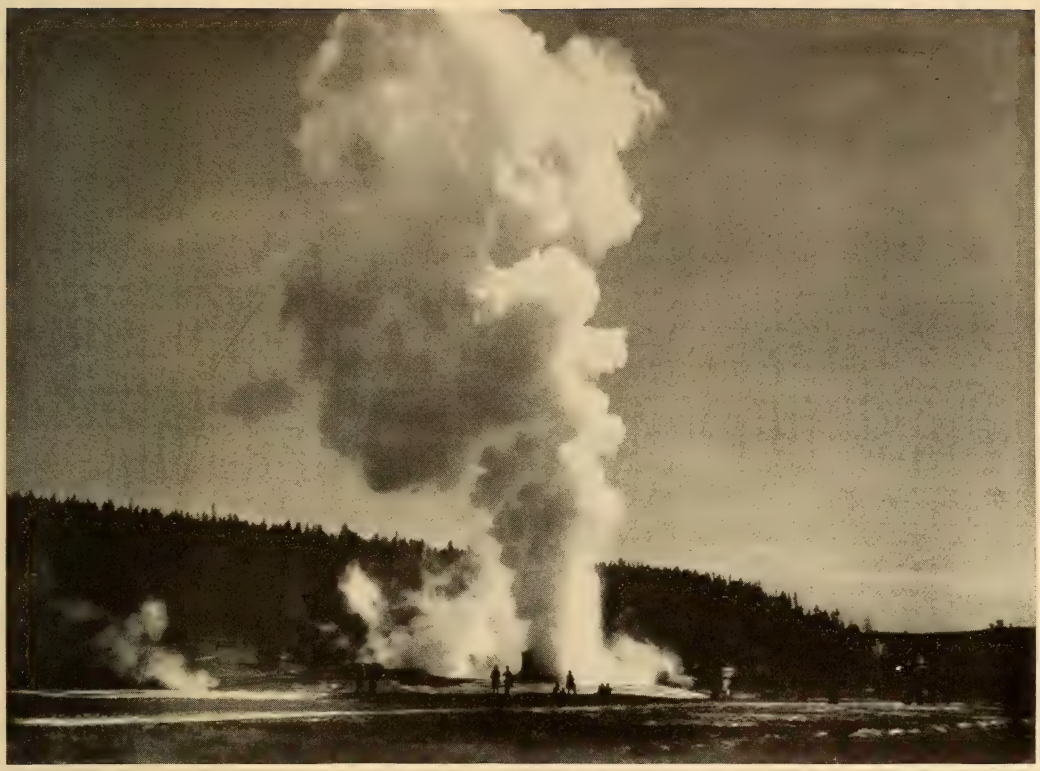
THE SENTINEL CYPRESS TREE: MONTEREY, CALIFORNIA

Clinging, a lone outpost, upon its headland perch of weather-riven rock, this melancholy cypress wreck has stood its watch, perhaps, for more than 2,000 years, buffeted without mercy by the rough Pacific blasts that have swept its bare abode unchecked and tormented it into a strange, gnarled shape. These cypress trees along the Californian coast are the last of their kind to find a foothold on our continent, for they fringe the line which just divides the surf and land.

Photo by George R. King

AVALON HARBOR: CATALINA ISLAND, CALIFORNIA

Catalina is a mountain range surrendered to the sea. Avalon harbor, its chief beauty, crescent-shaped, is a place of pilgrimage for some of the most famous anglers of America, Great Britain, and France. Tuna, black sea bass, white sea bass, and swordfish are taken in the clear, unruffled waters of its blue bay, and the mounting of trophy fish for the fishermen pilgrims has become an Avalon industry. The rich submarine gardens of Avalon Bay are famed, and so transparent are the waters that these sea landscapes may be studied in detail by the use of glass-bottom boats.



GIANT GEYSER: YELLOWSTONE NATIONAL PARK Photo by Haynes

Of the 84 geysers in Yellowstone National Park, no two are alike in their characteristics. The Constant Geyser sends forth graceful jets of water to a height of 20 feet once a minute. Giant Geyser discharges only once in from five to seven days. Old Faithful, however, is so regular that it might be called the clock of the subterranean world. In the 40-odd years that it has been known to the white man it has never "missed fire" once, the interval being 65 minutes.

A NOBLER DESTINY FORETOLD

And the lesson it furnishes will not be lost. When California shall have achieved her commercial destinies, it requires no prophet to foretell that this "City Beautiful" — far more beautiful than the city of Joaquin Miller's dream— will have a hundred counterparts in bronze and stone. At present, while garnering within its walls California's choicest products, its fruits and wines, grains of her upland farms, gold from her rich canyons, it may be held to represent the California spirit, the free, manly, generous spirit that gives its best without taking thought.

No one can do justice to the glories of California who forgets that other little land of wonder and region of marvel, the Panama - California Exposition at San Diego. If the Panama-Pacific bewilders, dazzles, and drives to speechless wonder and admiration every one whose great and good fortune it is to look upon it, the Panama-California charms, soothes, and gently delights its visitor. The one is the magnificent sunburst of diamonds, the other a splendid cluster of pearls, each with a beauty, an atmosphere, and a coloring all its own.

With its transplantation of all that is best in Latin-American architecture; with its wonderful collection of tropical flora, gathered from every point of the tropical compass; with its Montezuma Garden, its Painted Desert, its great tea plantation, its model intensive farm, and its working model of the Panama Canal, it is a little fairyland where fairies teach Pan - American history, Pan - American ideals, Pan-American possibilities by delighting the eye rather than by the old, slow, and painful method of hard study of our school days.

Courtesy of the Great Northern Railroad

BLACKFEET POINTING TO MT. WILBUR, PTARMIGAN LAKE: GLACIER NATIONAL PARK

This region has been called the roof of North America. In its mountains are eighty living glaciers. From their heights the waters divide and flow into the Gulf of Mexico, Hudson Bay, and the Pacific Ocean. Within the park are 250 glacier-fed blue mountain lakes and scores of silvery streams.

Photo by Frank Palmer

THE DEVIL'S TEAPOT: SPOKANE RIVER, WASHINGTON

A basaltic rock formation at the Bowl and Pitcher Falls in the Spokane River, four miles from the heart of the business section of Spokane. Spokane has the unique distinction of having two waterfalls within the city limits, their combined height being 150 feet. They have been harnessed to Spokane's industries and afford cheap light and power for the hustling capital of the Inland Empire.

Courtesy of Bellingham Chamber of Commerce

LOGGING TRAIN: PUGET SOUND

Ranking second among the States of the Union in the value of her timber resources, Washington has 391 billion board feet still on the stump. Oregon, with its 545 billion board feet, combined with Washington, constitutes one of the greatest, if not indeed the greatest, timber region in the world.

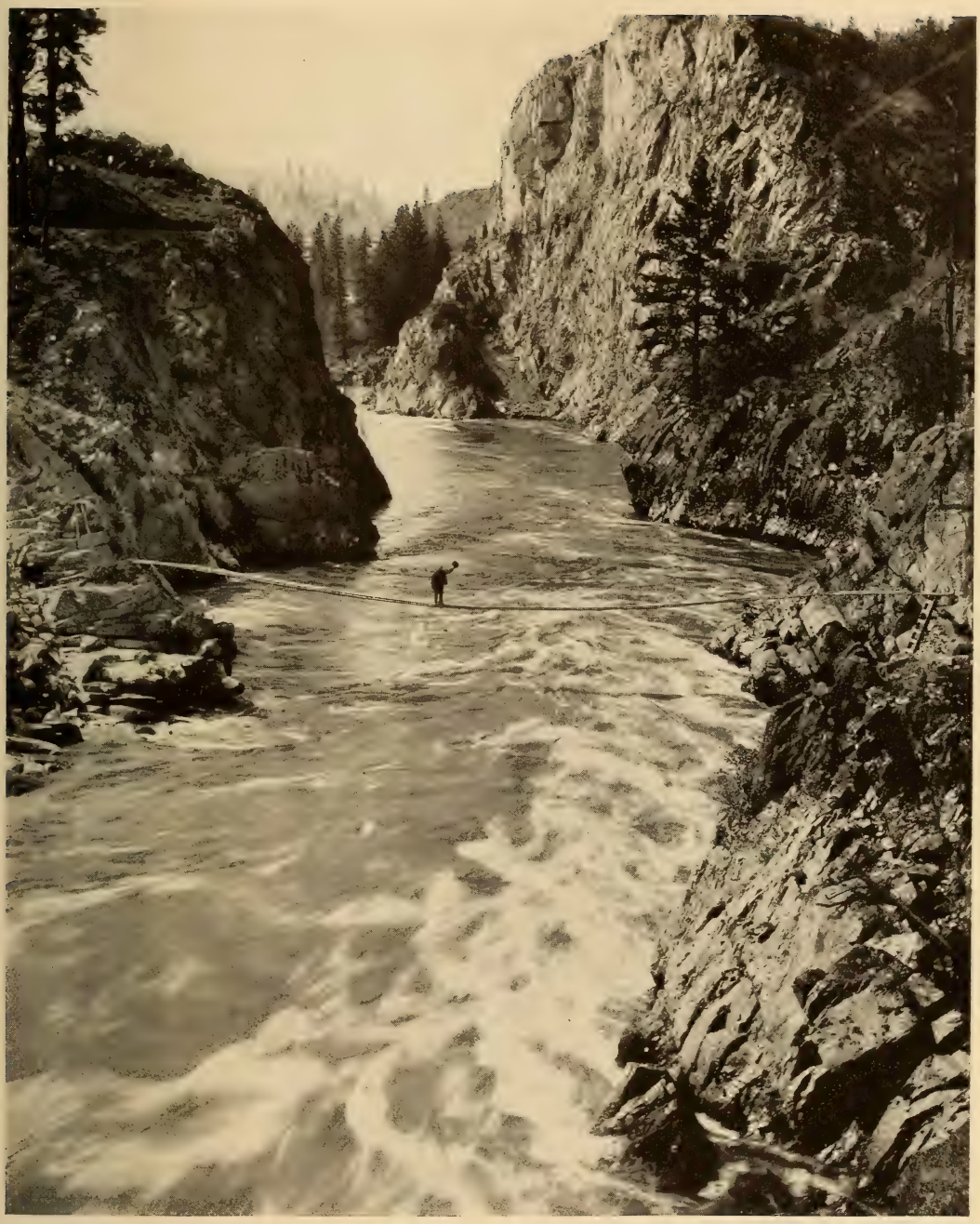


Photo by Frank Palmer

THE NARROWS, SPOKANE RIVER, NEAR THE CONFLUENCE OF THAT STREAM WITH THE COLUMBIA

The suspension bridge here seen was built for the use of the Indians, who cross from the reservation to the Indian school established on the site of old Fort Spokane. Below the confluence of the two rivers lies the "Great Plain of the Columbia," shut in on all sides by mountains, one of the most important wheat fields in the world.

Courtesy of Chicago, Milwaukee and St. Paul Railway

MOTORING ON GLACIER ROAD: MT. RAINIER NATIONAL PARK, WASHINGTON

"In the center of it there is a lovely mountain capped with ice; from the ice-cap glaciers radiate in every direction, and young rivers from the glaciers, while its flanks, sweeping down in beautiful curves, are clad with forests and gardens and filled with birds and animals. Specimens of the best of Nature's treasures have been lovingly gathered here and arranged in simple symmetrical beauty within regular bounds."—JOHN MUIR.

Courtesy of Chicago, Milwaukee and St. Paul Railway

TRAIL, VAN TRUMP PARK: MT. RAINIER NATIONAL PARK, WASHINGTON

Here, in the very shadow of the snow-capped crest of Mt. Rainier—the Mountain that was God—the valleys are literally carpeted with avalanche lilies, asters, anemones, rhododendrons, and other bright flowers

Courtesy of the Great Northern Railroad

HIDDEN LAKE, REYNOLDS PEAK, OLD MAN REYNOLDS: GLACIER NATIONAL PARK, MONTANA

With its 81 glaciers and 132 lakes, with peaks whose sides have never been scaled by human ambition, and lakes whose shores have never been trod by human foot, Glacier National Park abounds in wild beauty and untouched nature.

Courtesy of the Great Northern Railroad

PTARMIGAN LAKE, MT. WILBUR, HIKEINA: GLACIER NATIONAL PARK

More people are "seeing America" this year than ever before. The only advantage that Swiss scenery has over American is that it has been better advertised. Some day the tourist world will be coming to America as heretofore it journeyed to the Alps.

Photo by C. J. Blanchard

LAKE MC DONALD

There are two lakes of this name in Montana, one in Glacier Park and this one, which is located in Flathead County, Montana, on the Flathead Indian Reservation. It cannot be reached direct by railroad as yet

VOL. XXVIII, NO. 2 WASHINGTON AUGUST, 1915

THE NATIONAL GEOGRAPHIC MAGAZINE

AMERICAN GAME BIRDS

By Henry W. Henshaw

Chief of the U. S. Biological Survey and Author of "Common Birds of Town and Country," in the National Geographic Magazine

With Illustrations from Paintings by Louis Agassiz Fuertes

FROM the time of the earliest settlement of the country the wild game of America has proved a national asset of extraordinary value. Nowhere in the world, except in Africa, was there ever greater abundance and variety of wild life.

The forests of America were filled with game birds and animals, large and small; its streams, lakes, and ponds were covered with waterfowl, and its rivers and shores furnished highways for myriads of shorebirds as they passed north and south. Nature would appear to have stocked the continent with lavish hand. Indeed, but for the wild game our predecessors, the Indians, would not have been able to maintain existence, much less to advance as far as they did in the arts that lift peoples toward the plane of civilization.

And at first our own forebears were scarcely less dependent than the aborigines upon game for food. Many years of toil and struggle had to pass before the rude husbandry of the colonists sufficed to free them measurably from dependence on venison and wild fowl.

Nor will any student of American history doubt that, but for the services of our pioneer hunters and trappers who literally hunted and trapped their way from the Atlantic to the Pacific, the course of empire westward would have been halted for decades. As a consequence, the settlement of much of our fair land would have been long delayed, if, indeed, the land had not passed into the possession of other peoples.

Moreover, it was in the pursuit of game that the hardy frontiersmen developed skill as marksmen and acquired many of the rude border accomplishments which later made them effective soldiers in the war for independence.

Game existed everywhere, for the Indian, though wasteful of wild life and knowing naught of game laws, took what toll he would of the game about him, and yet made no apparent impression on its quantity; so that it passed into the hands of his successors, along with his lands, practically in its original state.

AMERICAN WATERFOWL AND SHOREBIRDS

And what a rich heritage it was! In addition to the upland game birds of the forests and open glades, great numbers of ducks and shorebirds found on our western prairies and in the innumerable lakes and ponds the food, solitude, and safety necessary during the nesting period. More important still as a nursery for wild fowl and shorebirds were, and

still are, the tundras of Alaska and the barren grounds that, dotted with countless lakes and rivers, stretch to the Arctic.

Here, in these northern wilds, solitude reigns supreme, and vast multitudes of waterfowl breed, assured of both food and safety. On these Arctic plains Nature has provided in a remarkable way for her winged servants by supplying an inexhaustible crop of berries. As the short summer season wanes the berries ripen and furnish a nutritious food upon which the waterfowl fatten and gain strength for their long southern journey.

Then the Ice King takes the remainder of the crop in charge, wraps it in a mantle of snow and ice, and keeps it safe in Nature's cold storage, ready for delivery in spring to the hungry migrants. Without this storehouse of berries it is doubtful if our waterfowl could sustain life in the Arctic, and the so-called barrens, instead of being a nursery for myriads of fowl, would indeed be barren so far as bird life is concerned.

When the short Arctic summer closes and the young birds acquire strength for the journey, multitudes of ducks, geese, swans, and shorebirds, anticipating the Arctic winter, wing their way to southern lands. Including these winged hordes from the Arctic that visit our territory and the birds that nest within our own limits, America possesses upward of 200 kinds of game birds, large and small, many of which are in the front rank, whether viewed merely from the economic standpoint as food or through the eyes of the sportsman.

FORMER ABUNDANCE OF GAME BIRDS

While the aggregate numbers of game birds are very great, they sink into insignificance when compared with their former abundance. The statements of the early chroniclers regarding the multitudes of ducks, plover, and wild pigeons almost defy belief. When, in the records of the first part of the last century, one reads of clouds of pigeons that required three days to pass a given point in a continuous moving stream, and again of flocks estimated to contain more than two billion birds, credulity is taxed to the limit.

Yet not only one such flock was observed, but they were of periodic occurrence during many years of our early history, and the accounts of them are too well attested to be doubted. As throwing a curious sidelight on the abundance of wild fowl and the hardships to which the slaves of the period were subjected, I quote a paragraph from Grinnell (American Game Bird Shooting), who states that "in early days slave owners, who hired out their slaves, stipulated in the contract that canvasback ducks should not be fed to them more than twice each week"!

CAUSES OF DECREASE OF GAME BIRDS

What, then, has become of the teeming millions that once possessed the land? Before attempting to answer this question it may be well briefly to review certain general causes that contribute to the depletion of the ranks of game birds. Among these may be mentioned natural diseases; natural enemies, both winged and four-footed; forest, brush, and prairie fires; the drainage of swamps and the general elimination of nesting grounds by the advance of agriculture; and finally, most potent of all the agencies of destruction—firearms.

From the nature of things, no data are available to show exactly the relative importance of the above causes of decrease or of their separate or combined effect. Nevertheless we can arrive at an approximate idea of their relative effect.

Natural diseases seem to play a comparatively unimportant part in causing the death of birds, except perhaps indirectly. In a state of undisturbed nature there are few sick or old birds, for the reason that the sick, the heedless, and the old, as soon as their strength begins to fail, are promptly eliminated by natural enemies, who, while foes of individual bird life, nevertheless do good service to the species in keeping the vigor of the stock at a high standard by promptly weeding out the unfit.

While the annual loss of game birds by attacks of predatory birds and mammals is no doubt very great, it is to be noted that it is relatively far less at the present time than formerly, owing to the

general destruction of birds of prey and of wild four-footed animals of whatever name or nature.

The contrary is true of that predatory animal, the house cat. Never were house cats more destructive of bird life than now. While the annual loss of insectivorous birds by them is far greater than that of game birds, the loss of woodcock, quail, grouse, and upland-breeding shorebirds is by no means small. Taking into account bird life in general, the cat is undoubtedly the most destructive mammal we have, and the aggregate number of birds annually killed by them in the United States is enormous.

Of late years serious losses have been reported among the ducks of certain localities in the West. The causes are yet obscure, but they are probably not due to epidemics, as commonly believed. They will probably prove to be very local and of comparatively modern origin, and to be dependent on drainage contaminations or unnatural crowding into unfavorable feeding grounds. It is hence highly probable that such losses can be eliminated either in whole or in part.

Before the coming of the whites, forest and prairie fires were due to lightning or were purposely set by the Indians to facilitate the pursuit of large game. While they were no doubt common at certain seasons and probably fatal to many birds, they were too insignificant to have played an important part in the reduction of numbers.

FIREARMS THE CHIEF CAUSE OF DECREASE

The destruction of former breeding grounds through drainage and the general advance of agriculture is a very important cause of the diminution of certain species. But while agriculture usurps the breeding grounds of many kinds, especially ducks and geese, its effect in this direction is to some extent lessened, since it prepares the way for other species, like the upland game birds, and furnishes food and breeding grounds for them. While these and other causes that might be enumerated have tended to diminish the numbers of game birds, even taken collectively they have played only a minor part in the great reduction of these birds as a whole.

It is the gun that has been the chief cause of the destruction of our game, large and small. Whatever weight may be attached to other causes, these fade into insignificance when compared with the effect of firearms.

It is nothing short of marvelous how little time was required by the early pioneers, even with the crude firearms of the time, to make an impression on the abundance of American game. What the Indian with his bow and arrow and his rude nets failed to do in thousands of years, the handful of white men with powder and shot accomplished in a few decades.

Writing within 40 years after the first settlement in New England, Josselyn states that already the wild pigeon had diminished greatly, "the English taking them with nets"; and he adds that the English and Indians, who by this time were supplied with guns, had "destroyed the breed of wild turkeys, so that even at that early day it was very rare to meet one in the woods."

Thus two of our most important game birds, in less than half a century after the first settlements, had already begun to disappear from the neighborhood of the New England colonies. Nor is there reason to believe that it was different in other parts of the country. Game abounded, was needed for food, the supply seemed inexhaustible, and it was shot regardless of consequences, and at first, no doubt, without thought of them.

It is undoubtedly true that up to the present time far more strenuous efforts have been made in this country to destroy game than to preserve it. Even to-day a vastly greater number of individuals are interested in game as something to kill than as something which deserves protection. Clubs having for their chief object the pursuit of game of all kinds have existed since early days; but organizations having for their chief object the preservation of game are relatively few in number and of comparatively recent origin.

AMERICA A SPORTSMAN'S PARADISE

America has always been a paradise for sportsmen, but of late years the number of those whose chief relaxation is the pursuit of game has greatly increased,

AMERICAN MERGANSER (Mergus americanus).

Range: Breeds from southern Alaska, southern Yukon, Great Slave Lake, central Keewatin, southern Ungava, and Newfoundland south to central Oregon, southern South Dakota, southern Minnesota, central Michigan, northern New York and northern New England; winters from Aleutian Islands, British Columbia, Idaho, northern Colorado, southern Wisconsin, southern Ontario, northern New England, and New Brunswick south to Lower California, northern Mexico, Texas, Louisiana, and Florida.

The narrow, serrated bill of the goosander as contrasted with the broad, smooth bills of most ducks would suggest to the merest tyro that its habits must differ widely from those of most of its kin. In fact, the goosander's bill, with its saw-like teeth, is specially adapted to seizing and holding slippery prey of various kinds including small fish which, though not its sole food, constitute the most important part of it. Water insects, frogs, and crawfish, are by no means disdained. The goosander's long, narrow body eminently fits it for swift progress under water where it spends much of its time. Cold weather and ice have no terrors for it, and the bird may winter wherever open water is assured, provided only that food is abundant. Not many goosanders remain within our territory to breed, and these retire to the mountains where they find along the foaming mountain torrents the surroundings they prefer. The merganser follows the general custom among ducks and nests on the ground, but unlike many it nests also in hollows of trees. As it does not associate in large flocks and has learned to care well for its safety, the bird is holding its own very well.

MALLARD (Anas platyrhynchos).

Range: Breeds from Pribilof Islands, northwestern Alaska, northern Mackenzie, central Keewatin, and Greenland south to Lower California, southern New Mexico, southern Kansas, central Missouri and southern Indiana; winters from Aleutian Islands, central Alaska, central Montana, Nebraska, southern Wisconsin, northern Indiana, Ohio, Maryland, south to Mexico, the Lesser Antilles, and Panama.

This fine duck is monopolized by no one country nor even continent, but includes in its range both hemispheres. Its size, abundance, and excellent flavor make it perhaps the most important of its family, and its value to mankind is still further enhanced by the fact that it lends itself so readily to domestication that many of our domestic varieties are derived from it. Before the settlement of the West the ponds and sloughs swarmed with mallards, which nested there by thousands, and in fall and winter, as migrants and winter residents, covered the water courses to the south. To-day there is a very different story to tell. Many of the mallards' old breeding grounds are now farms, and the bird is now represented by a few hundreds where once there were myriads. The mallard is one of our most omnivorous ducks, and nothing in the way of mast, grain, or small animal life comes amiss. In the far West it has the habit, shared to the same extent by no other duck, of resorting to the stubble for waste grain, and the epicure need ask for nothing more delicious than a fat corn- or wheat-fed mallard. The domestication of this duck is easy, and the owners of estates with suitable ponds can render good service in the cause of wild-fowl preservation by raising mallards for liberation.

RED-BREASTED MERGANSER (Mergus serrator).

Range: Breeds from Arctic coast of Alaska, northern Mackenzie, Cumberland Sound, and Greenland (lat. 73°) south to southern British Columbia, southern Alberta, southern Minnesota, central Wisconsin, northern New York, and southern Maine; winters in southern Greenland, Commander Islands, and from southern British Columbia, Utah, Colorado, southern Wisconsin, southern Ontario, and Maine south to southern Lower California, Louisiana, and Florida.

The red-breasted merganser is the second of our mergansers in size, and while its habits in general correspond well with those of the larger goosander, they differ in some important respects. The red-breast, for instance, frequents salt water far more than its relative, though it, too, inhabits the interior lakes and ponds. It swims and dives with wonderful skill, and in clear, rapid mountain streams, even the swift and wary trout is not safe from its prowess. This merganser used to breed rather commonly in New England, and it still nests in the northern parts, though in diminished numbers. Apparently it never breeds in hollow trees but conceals its nest on the ground among rocks or bushes. Like its larger relative, this duck does not "flock," and the little parties of five or eight probably represent parents and young, which from motives of attachment or safety, keep together. Eaton ascribes to this merganser a habit which would argue unusual intelligence and cooperative ability. He says, "These mergansers are often observed to hunt in company, a large flock sometimes advancing with wide, extended front, driving the fish before them and diving simultaneously, so that whichever way their prey may dart there is a serrated beak and capacious gullet ready to receive them."

HOODED MERGANSER (Lophodytes cucullatus) (See page 126).

BLACK DUCK (Anas rubripes).

Range: Breeds from central Keewatin and northern Ungava south to northern Wisconsin, northern Indiana, and southern Maryland; winters from Nova Scotia south to southern Louisiana and Colorado; ranges west in migration to Nebraska and central Kansas.

The black duck is essentially confined to the Eastern States, usually migrating no farther west than Kansas, and that rarely. It is a favorite object of pursuit by sportsmen, and in the struggle to maintain existence has learned its lesson so well that it is still comparatively numerous in localities where less wary species would long ago have been exterminated. Originally a diurnal-feeding species, like most ducks, persecution has taught the black duck to seek safety on the broad ocean during the hours of daylight, and to resort to inland ponds for the purpose of feeding only after sunset. In order to protect this and other waterfowl one of the regulations under the Federal migratory bird law forbids shooting after sunset and before sunrise, and the enforcement of this regulation will probably do more for the preservation of the black duck than any other provision that could be devised. That protection for this species is sorely needed appears from the fact that throughout its range, except in a few localities, the black duck has of late years steadily diminished in numbers.

The black duck is excellent eating, and as experiments prove that it can be reared in captivity it may be raised for the market or be freed for restocking suitable localities.

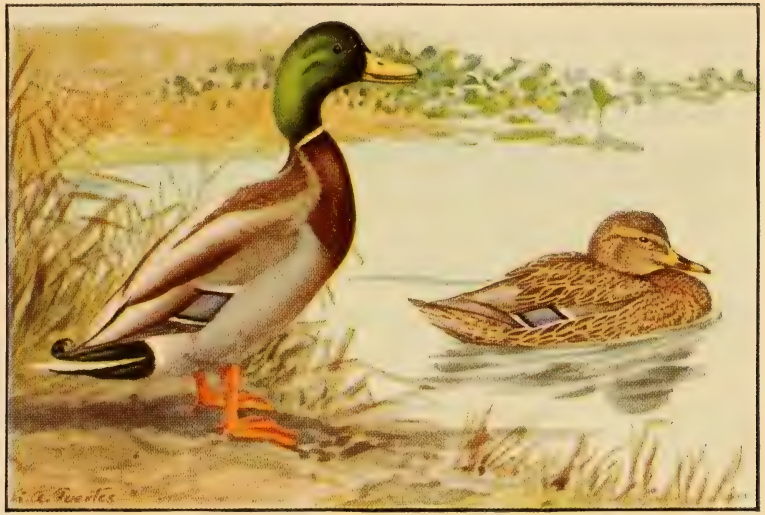
The Florida black duck is a closely allied species, with similar habits, and is resident in Florida and along the Gulf Coast.

Male Female Male Female

AMERICAN MERGANSER RED-BREASTED MERGANSER

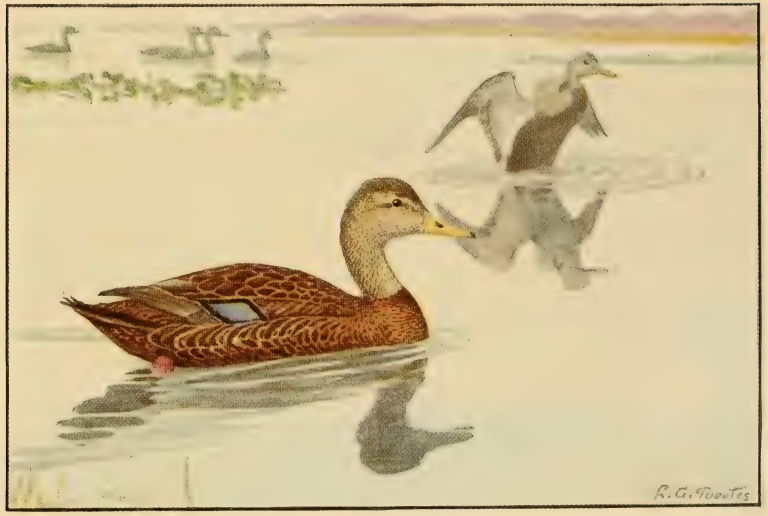
Female Male

HOODED MERGANSER



Male Female

MALLARD



BLACK DUCK

GADWALL (Chaulelasmus streperus) (See page 126).

GREEN-WINGED TEAL (Nettion carolinense).

Range: Breeds from Aleutian Islands, northwestern Alaska, northern Mackenzie, central Keewatin, northern Ungava, and Newfoundland south to central California, northern New Mexico, northern Nebraska, northern Illinois, southern Ontario, Quebec, and New Brunswick; winters from Aleutian Islands, British Columbia, Nevada, southern Nebraska, northern Indiana, western New York, and Rhode Island south to southern Lower California, the West Indies, and Honduras.

Though still numerous in parts of the far West, the green-winged teal has ceased to be even common in the Atlantic States, where it is likely soon to be quite exterminated. The green-wing does not frequent large lakes and open water but shows a marked preference for fresh-water marshes and grass-fringed ditches. It is remarkable in how small a waterway a flock will hide away and if undisturbed feed contentedly for hours. The reasons for the marked decrease in the number of this species are not far to seek. Few ducks decoy better, and when a number of the flock are stretched on the water, the survivors will once and again return to their comrades as if totally unable to grasp the situation or to realize the necessity of saving their own lives by flight. This teal is not much of a diver, for the shallows in which it usually feeds do not require exercise of the art. Many will attest to the excellence of roast teal, but few will agree with Audubon in his opinion that when teal are feeding on soaked rice or wild oats they are far superior to the canvas-back.

BLUE-WINGED TEAL (Querquedula discors).

Range: Breeds from central British Columbia, Great Slave Lake, central Ungava, and Newfoundland south to central Oregon, northern Nevada, northern New Mexico, central Missouri, southern Indiana, northern Ohio, western New York, and Maine; winters from southern British Columbia, Arizona, southern Illinois, Maryland, and Delaware south to the West Indies and South America as far as Brazil and Chile.

Formerly abundant and nesting over much of eastern United States, the blue-wing still inhabits most of its former range, but is numerous only in the Middle West. Though found west of the Rockies it is there replaced for the most part by the cinnamon teal. Its habits may be described in much the same terms as those of its congener, the green-wing. Like that bird, it also is a lover of fresh-water ponds and streams with grassy banks. The blue-wing migrates south early, and teal shooting in early September in some localities is one of the sporting events of the year. Extremely fond of wild rice, this duck is generally regarded as a tidbit, and it is at its best when it has fattened on this nutritious seed. Though extremely swift of wing, its speed avails it little in the long run since it is tame and unsuspicious, decoys well, and is easily approached and potted when feeding in its grassy coverts. How much the abolition of spring shooting will accomplish for this and the green-wing remains to be seen. Should it fail, then the most stringent protective measures as to short open season and bag limit will have to be adopted if these attractive little teal are to remain with us.

BALDPATE (Mareca americana).

Range: Breeds from northwestern Alaska, northern Mackenzie, and central Keewatin south to Oregon, Nevada, Utah, Colorado, Kansas, southern Wisconsin, and northern Indiana; winters from southern British Columbia, Arizona, southern Illinois, Maryland, and Delaware south to southern Lower California, the West Indies, and Costa Rica.

The beautiful baldpate is widespread over the fresh-water lakes and ponds of the United States from ocean to ocean. Formerly this bird nested in great numbers in the Western States, but of recent years its nesting grounds have been greatly restricted, and now most of the ducks that visit the United States come from farther north. The baldpate used to be one of the most abundant of ducks, and only recently was to be met with in large flocks, but it has been so greatly reduced in numbers by sportsmen and market gunners, that it can be said to be abundant in only a few localities. When disturbed in ponds near the coast, it has learned to find safety on the ocean, returning to its feeding grounds only when it thinks all danger has passed. It has become one of the wariest of ducks and, like the black duck, has reversed its natural habits in many localities and become a night feeder, devoting the hours of daylight to safeguarding its life by incessant watchfulness. Like most other ducks, the baldpate is fond of wild celery, but as its skill as a diver is small, it essays the role of highwayman, and when the canvas-back or redhead appears on the surface with a bill full of the coveted grass, the fruit of honest toil, it snatches the booty and makes off with it.

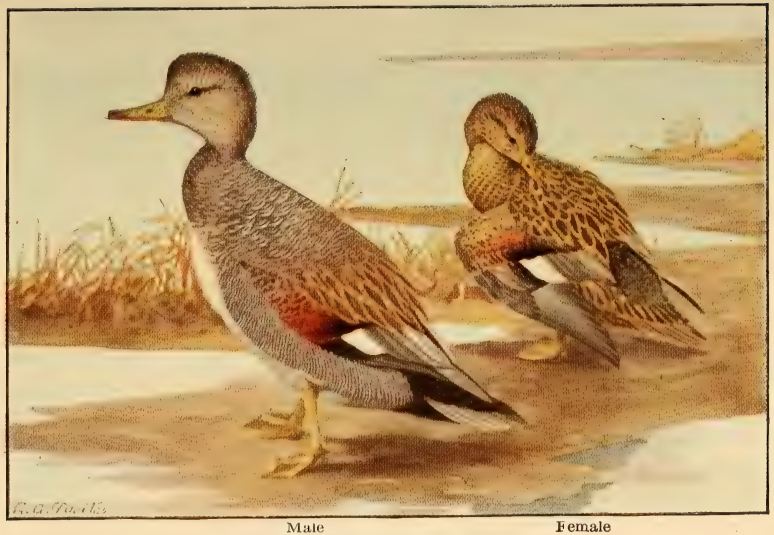
EUROPEAN WIDGEON (Mareca penelope).

Range: Occurs occasionally in winter and in migration from Wisconsin, Michigan, New York, Nova Scotia, Newfoundland, and Greenland south to Nebraska, Missouri, Indiana, Ohio, North Carolina, and Florida, and in Alaska, British Columbia, and California.

In general appearance the European widgeon rather closely resembles our baldpate. The males are easily identified, but a rather careful comparison is needed to distinguish the females. For one thing the head and throat of the female European widgeon are browner than the corresponding parts of our baldpate. A better distinguishing mark, however, is found in the axillars, or long feathers under the wings of both sexes, as noted by Bangs. In our baldpate these are white, while in the European widgeon they are grey. Particular attention is directed to these distinguishing marks, as sportsmen should know the two birds apart, and thus be enabled to record the fact when they bring to bag the European widgeon. The bird has long been known to occur in our waters, but its presence has been thought to be only casual. Of late years it appears to seek our shores in increasing numbers; at all events it is being reported oftener. This is probably due less to an actual increase of numbers than to the fact that sportsmen are becoming better acquainted with its appearance. The bird may indeed prove to be, as Forbush believes, a permanent resident of North America. There are more records of its occurrence along our Atlantic coast than elsewhere, but the bird has been found also in Nebraska, California, and Alaska. The habits of the European widgeon while in our waters offer nothing particularly worthy of note, as distinguished from those of our own baldpate. The call note of the male, Saunders tells us, is a shrill whistling "whe'e-you," whence the local names "whew duck" and "whewer."

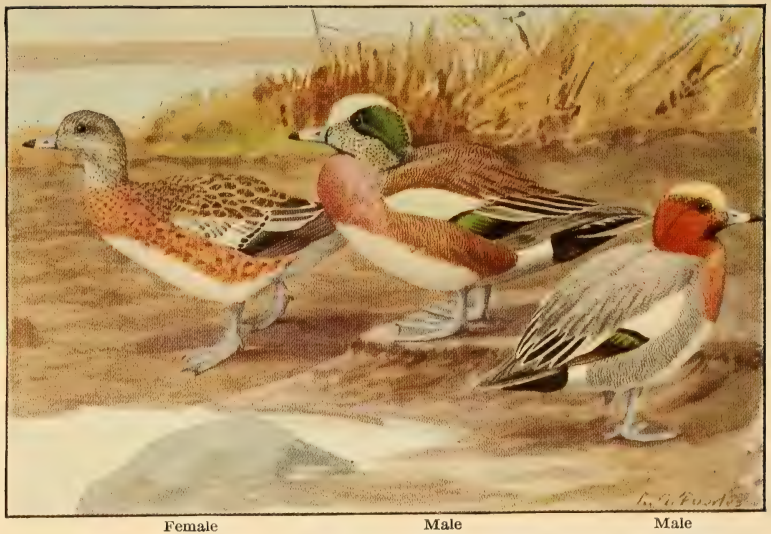
CINNAMON TEAL (Querquedula cyanoptera) (See page 126).

SHOVELER (Spatula clypeata) (See page 126).



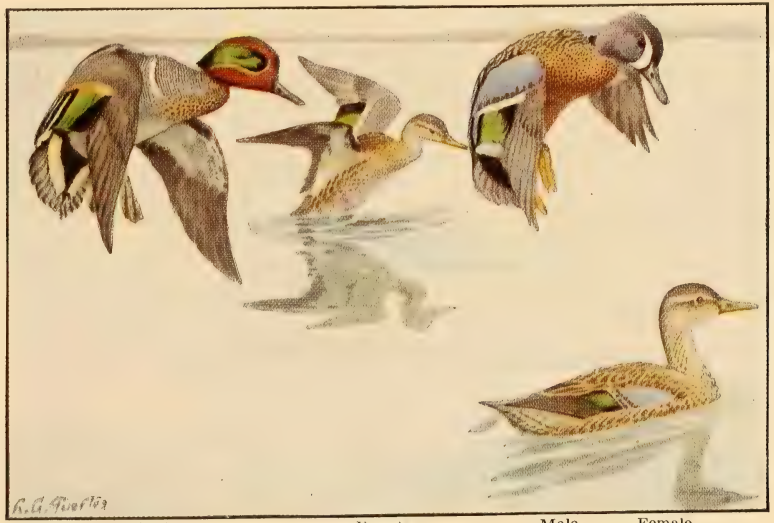
Male Female

GADWALL



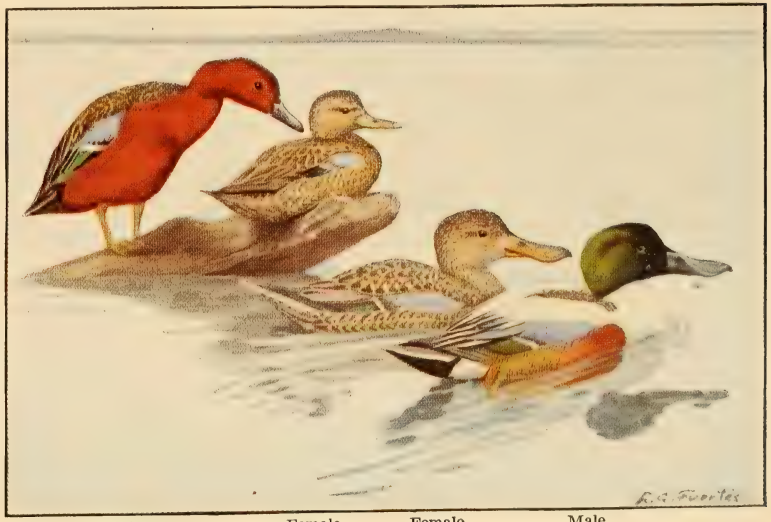
Female Male Male

BALDPATE EUROPEAN WIDGEON



Male Female Male Female

GREEN-WINGED TEAL BLUE-WINGED TEAL



Male Female Female Male

CINNAMON TEAL SHOVELLER

PINTAIL (Dafila acuta).

Range: Breeds on Arctic coast from Alaska to Keewatin and south to southern California, southern Colorado, northern Nebraska, northern Iowa, and northern Illinois; winters from southern British Columbia, Nevada, Arizona, southern Missouri, southern Wisconsin, southern Ohio, and Delaware south to Porto Rico and Panama.

The pintail, one of our most beautiful ducks, is easy of recognition owing to its long slender neck and elongated pointed tail. The latter has caused it to be known locally in England as the "sea pheasant." It is no longer common in the Eastern States but continues to exist in considerable numbers in the West. It is swift of wing, and an old pintail coming down wind will tax the nerve and skill of the most experienced sportsman. In California I once witnessed a life and death race between an adult male pintail and a prairie falcon. The duck covered a half mile at its topmost speed, but notwithstanding its swiftness, the falcon outmatched it, and would have dined on duck that October day had not the fowl, apparently realizing the extremity of its danger, swerved in a half circle toward me, the interested spectator, when the falcon, too distrustful of man to follow, gave up the chase in disgust. Most wild ducks are fond of berries, and Nelson states that in far-off Alaska in August the pintail fattens on berries and becomes the most delicious waterfowl of the region. The pintail is one of the few ducks that braves the long two-thousand-mile trip from the Aleutians to the Hawaiian group apparently for the pleasure of wintering in those sunny islands.

CANVAS-BACK (Marila valisineria).

Range: Breeds from central British Columbia, Fort Yukon, Great Slave Lake, and southwestern Keewatin south to Oregon, northern Nevada, Nebraska, and southern Minnesota; winters from southern British Columbia, Nevada, Colorado, Illinois, Pennsylvania, and western New York south to central Mexico (Jalisco) and the Gulf coast.

The canvas-back, perhaps the most famous of American waterfowl, has purchased its fame at a price. So highly is it prized by the epicure that to-day he who can afford to dine on canvas-back sets the mark of luxurious living. Not that the canvas-back differs essentially from other ducks, but its exceptional flavor is due to the fact that its favorite food is "wild celery," a long ribbonlike grass which grows in shallow ponds and estuaries. As the plant roots several feet under the surface, only the diving ducks can secure it and the plebeian kinds have to be content with such floating fragments as they can pick up or can steal from their more aristocratic relatives. In Oregon and Washington the canvas-back lives much upon wapato, a bulblike root formerly a staple article of food among many Indian tribes, and their exceptional flavor is said to be little, if any, inferior to that of the celery-fed canvas-back of the East. Elsewhere the flesh of the canvas-back is in nowise superior to that of other ducks, and in some localities on the west coast, indeed, is inedible because of its rank smell and taste. Thus prized alike by the sportsman and by the epicure the ranks of the canvas-back have been depleted by the relentless pursuit to which it has been subjected. However, the greater number of these ducks breed far to the northward where they are safe, and under present laws their numbers should increase to something like their former abundance

REDHEAD (Marila americana).

Range: Breeds from southern British Columbia, central Alberta, central Saskatchewan, and southwestern Keewatin south to southern California, Utah, southern South Dakota, southern Minnesota, and southern Wisconsin; winters from southern British Columbia, Utah, New Mexico, Kansas, Illinois, Maryland, Delaware, and Massachusetts south to southern Lower California, central Mexico, and Florida.

In the minds of epicures and sportsmen the redhead is closely associated with the canvas-back. Both species often frequent the same feeding grounds and, as the redhead is as expert at diving as its cousin, it has no difficulty in obtaining its share of the coveted wild celery. This naturally imparts to its flesh the same highly prized flavor which constitutes the canvas-back's chief claim to distinction, and he must possess a delicate taste indeed who can distinguish the difference. Yet, at times there is much in a name and our redhead pays for his taste for celery and his general undesirable likeness to the canvas-back by being sold in the market as bona fide canvas-back. The redhead is much more numerous east of the Rocky Mountains than to the west of that chain and, while many visit the bays and estuaries of the east coast, the duck's preference appears to be for inland lakes and ponds where it subsists upon various aquatic plants, as also upon insects, snails, acorns, beechnuts, and in fact upon almost anything that is edible by waterfowl standards. Under such circumstances its flesh is no whit better than that of a dozen other species. Of late years a serious reduction of the numbers of this fine fowl has occurred, but it is believed that the abolition of spring shooting will materially aid in checking further decrease.

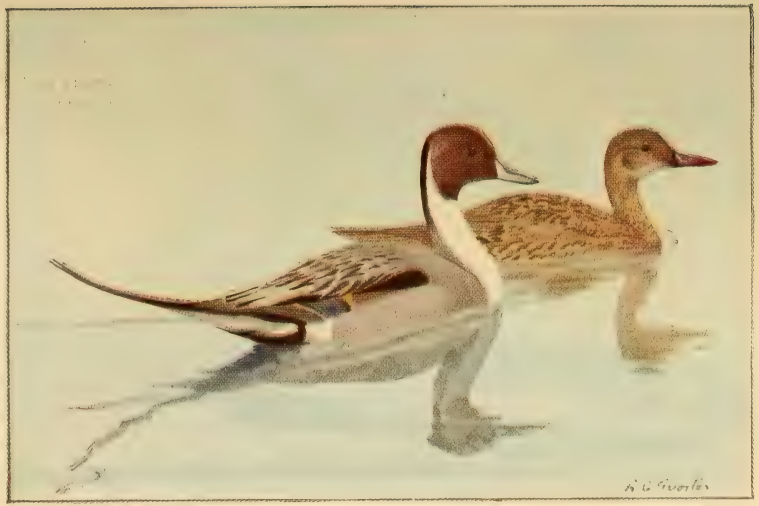
GREATER SCAUP DUCK (Marila marila).

Range: Breeds from Aleutian Islands, northwestern Alaska, Great Slave Lake, and central Keewatin south to southern British Columbia and northern North Dakota; winters from Maine to Florida and the Bahamas, and from Aleutian Islands, Nevada, Colorado, and Lake Ontario south to southern California, southern New Mexico, and southern Texas.

Both on the east and the west coast the scaup duck is emphatically a bay or estuary species and prefers salt or brackish water. Formerly it frequented such localities in flocks of thousands, often associated with the lesser scaup from which it is not readily distinguishable at a distance. Notwithstanding the fact that both scaups breed chiefly in the far North, their numbers have been greatly depleted of recent years, and the immense rafts that formerly used to gladden the heart of the sportsman are things of the past. The greater scaup used to winter in great numbers in the estuaries of the Gulf States, and in the troubled waters of Lake Borgne. In heavy gales, I have seen "rafts" of bobbing, black heads that apparently extended for miles. Even in those days (1871) the scaup had learned wisdom, and in open water it was only with great difficulty that a shot was to be obtained from skiff or sail boat. As the craft approached nearly within range the birds rose in dense masses and settled down a safe distance ahead, to repeat the performance till the patience of the sportsman was exhausted. Both scaups are expert divers, and are formidable competitors of the canvas-back and redhead in their quest for the rootstocks of wild celery. In the interior their food is much like that of other ducks, and many of the insects, snails, and other food they eat, including wild rice, are obtained without the trouble of diving.

LESSER SCAUP DUCK (Marila affinis) (See page 127).

RING-NECKED DUCK (Marila collaris) (See page 127).



Male Female

PINTAIL

Male Female

REDHEAD

Female Male Female

CANVASBACK

Male Female Male Female Male Female

GREATER SCAUP LESSER SCAUP RING-NECKED DUCK

GOLDEN-EYE (Clangula clangula americana).

Range: Breeds from central Alaska, northern Mackenzie, central Keewatin, northern Ungava, and Newfoundland south to southern British Columbia, southern Montana, northern North Dakota, northern Michigan, northern New York, and northern New England; winters from Aleutian Islands, Utah, Nebraska, Minnesota, Lake Erie, Maine, and New Brunswick south to southern California, central Mexico, and Florida.

Though classed in the books as a "bay or sea duck," the golden-eye, or whistler, is partial to broad rivers or estuaries, and formerly abounded in the Eastern States. Though by no means the only duck to make a whistling sound with its wings as it hurtles through the air, the golden-eye "whistles" louder than any other, and sometimes, indeed, announces its approach by its whistling wings before its oncoming form can be distinguished. Certain of our ducks, among them the whistler, have been taught, probably by bitter experience, that there are many four-footed prowlers with a taste for duck eggs, and that a nest full of eggs is never quite safe when entrusted to Mother Earth, no matter how artfully concealed. Hence, these birds, wiser than their relatives, lay their eggs in hollow trees often many feet from the ground, whence at the proper time the young, with or without the aid of their parents, find the way to the nearest water. The whistler is an excellent diver, and in some localities utilizes its skill to procure mussels from the bottom. The bird has not only learned the range of a shotgun to a nicety, but also the dangers that lurk in blinds, sink boats, and the like, and in a general way by cunning and wariness has shown itself well able to care for its safety. Nevertheless, there are few, if any, places where whistlers exist in their former abundance.

BARROW'S GOLDEN-EYE (Clangula islandica).

Range: Breeds from south central Alaska and northwestern Mackenzie to southern Oregon and southern Colorado, and from northern Ungava to central Quebec; winters from southeastern Alaska, central Montana, the Great Lakes, and Gulf of St. Lawrence south to central California, southern Colorado, Nebraska, and New England.

The resemblance which Barrow's golden-eye bears to the common whistler is extraordinarily close. The males, as a glance at the illustration will show, are easily enough distinguished when close by, but to tell the females and young apart with absolute certainty is impossible. It comes to us as a migrant in the late fall and sojourns along our northern borders, where it is often shot and sent to market with the more numerous common whistler.

OLDSQUAW (Harelda hyemalis).

Range: Breeds from islands of Bering Sea, Arctic coast of Alaska, Melville Island, Wellington Channel, Grinnell Land, and northern Greenland south to Aleutian Islands, east-central Mackenzie, northern Hudson Bay, and southeastern Ungava; winters from Aleutian Islands south regularly to Washington, and in southern Greenland, and from Gulf of St. Lawrence south regularly to the Great Lakes and North Carolina.

Breeding, as it does, in far away Arctic lands, and visiting the United States only in late fall and winter, this beautiful and graceful duck is known to only a few and these chiefly sportsmen. The flesh of the old-squaw does not commend itself to civilized palates, and yet under the guise of sport thousands are annually slaughtered, especially in spring, because, forsooth, their swift flight makes them tempting marks for the wing shooter. Bags of two or three hundred are not uncommon, although so little are they esteemed that, as Forbush states, many, both dead and crippled, are allowed to drift away with the tide. The old-squaw has a habit, unusual among ducks, of circling high in air and then descending in spirals with a resounding rush of wings. Flocks of a hundred or more sometimes participate in this pastime, for such it appears. This duck is a master diver and according to Eaton, individuals have been netted in the Great Lakes at the extreme depth of 162 feet. As a family, the ducks are by no means noted for their musical ability, and yet Nelson tells us that during the nesting season in Alaska the male old-squaws utter a series of rich musical notes which are so deep and reed-like that they have earned for the bird among the fur traders the title of "organ duck."

BUFFLEHEAD (Charitonetta albeola).

Range: Breeds from upper Yukon, lower Mackenzie, Great Slave Lake, and central Keewatin south to British Columbia, northern Montana, and central Ontario; winters from Aleutian Islands, British Columbia, Idaho, Colorado, Missouri, southern Michigan, western New York, and New Brunswick south to northern Lower California, central Mexico, and Florida.

The common name of this little duck is strikingly suggestive of its appearance, for the head, with its white markings and fluffy feathers, seems too big for the diminutive neck and body. An equally suggestive name in fall, when it becomes very fat, is "butterball." Though by no means strictly confined to fresh water, the buffle-head prefers fresh water, and is more abundant on the larger lakes and ponds of the far West than in eastern waters. Wherever found, east or west, it is extremely friendly, and when the gunner puts out a flock of wooden decoys our little duck immediately responds to the invitation to alight and be sociable. Taking advantage of this amiable weakness—some might call it stupidity—the gunner has already greatly reduced the number of buffle-heads, and left scarcely a tithe of their former thousands. Very few ducks can dive more quickly at need than the buffle-head, and in this respect it almost rivals the little grebe known as the "water-witch" or "hell diver." This skill as a diver is of great service to the duck in its search for food. It is adept at catching small fish and, perhaps, because of this and of other animal food, its flesh is not greatly esteemed.

HARLEQUIN DUCK (Histrionicus histrionicus).

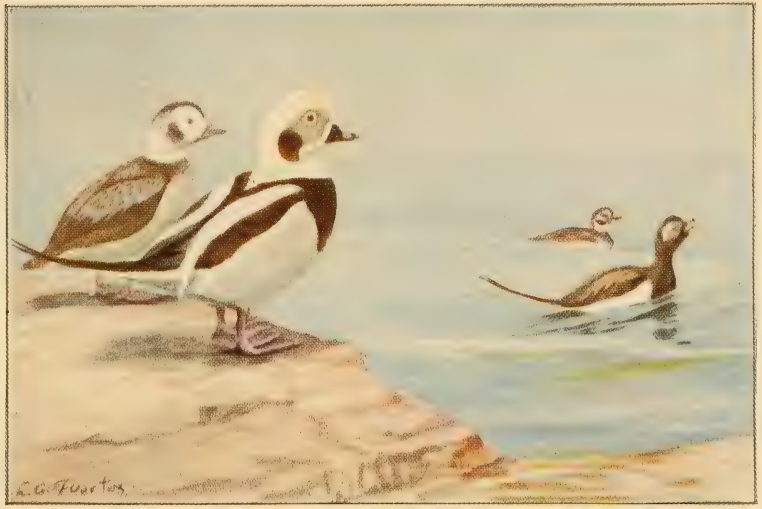
Range: Breeds from Kowak and Yukon rivers, Alaska, Arctic coast, and Greenland south to southwestern British Columbia, central Mackenzie, northern Ungava, and Newfoundland, south in mountains to central California, southwestern Colorado, northeastern Asia and Iceland; winters on Pacific coast from Aleutian Islands to Monterey, California, in interior to Colorado, Missouri, Lake Michigan, and western New York, and on the Atlantic coast from Gulf of St. Lawrence regularly to Maine.

The name "harlequin" suggests the unusual and somewhat bizarre plumage of this duck which, nevertheless, deserves to be classed among our most beautiful waterfowl. Rare everywhere in the United States except along our northwest coast, the harlequin breeds commonly in Alaska and uncommonly in the States from Colorado and California northward. Unlike most other ducks, the harlequin disdains to nest in the lowlands, but in summer withdraws itself from its kind and hies to the mountain solitudes where it dwells on the swift alpine streams, its only companion the water ouzel. In fall it resorts to the coast and assembles in small bands with flocks of other species, among which the male harlequins are rendered conspicuous by their striking markings.

Female Male
GOLDEN-EYE

Female Male
BARROWS GOLDEN-EYE

Male Female
BUFFLEHEAD



Female Male Winter Plumage
OLD SQUAW

Male Female
HARLEQUIN DUCK

STELLER'S EIDER (Polysticta stelleri).

Range: Breeds from Point Barrow, Alaska, to northern coast of Siberia and south to Aleutian Islands: winters on Aleutian Islands and Kenai Peninsula, Alaska, and south on the Asiatic coast to Kuril Islands.

Steller's hardy and beautiful duck is American by virtue of our possession of Alaska, for even in winter it does not venture south as far as either the Atlantic or the Pacific Coast States. According to Nelson the coast and islands of Bering Sea constitute the eastern range of this eider, and it breeds by tens of thousands on the North Siberian coast. Nelson found these ducks rather numerous in the quiet waters of bays and fjords of the Aleutian Islands the last of May, but they were very shy and he failed to secure a single individual. They winter in such of the Alaskan bays as are free from ice, and at this season the natives who depend upon them for winter food kill great numbers. This eider is a true sea duck and Turner notes that it keeps well off shore except in boisterous weather. Needless to say then that its food consists of animal life gleaned from the sea and that the bird is a skillful diver, reaching great depths and staying under a long time, as do eiders generally.

SPECTACLED EIDER (Arctonetta fischeri) (See page 127).

LABRADOR DUCK (Camptorhynchus labradorius).

Range: Formerly, northern Atlantic coasts; supposed to have bred in Labrador; wintered from Nova Scotia south to New Jersey.

The Labrador duck's history is shrouded in mystery. It is now known to be extinct but of the causes of its disappearance we know little or nothing. Occupying as it did such a restricted range, the bird was probably never abundant, at least in historic times. Many years ago George N. Lawrence told me that in his recollection, somewhere probably about 1850, it was by no means uncommon in Fulton Market, and no one at that time appears to have suspected that the bird was in any particular danger of extinction. Apparently its habits were those of a sea duck, and as it could have possessed no great value for the table there would seem to have been no particular incentive for its pursuit. We know so little about the bird that speculation as to the cause of its extinction is useless but, as suggested by Forbush, the slaughter of waterfowl on the Labrador coast in the eighteenth century may have had much to do with it. The lesson to be drawn from its fate is that if a game bird like the Labrador duck can become extinct in historic times from no assignable cause we should be doubly careful not to reduce the numbers of any of our valuable game birds to a point which threatens their future, since when reduced beyond certain limits, the precise limits being as yet unknown, recovery seems to be impossible, as witness the history of the passenger pigeon and the Eskimo curlew.

So far as known, the last Labrador duck seen alive by man was taken at Grand Menan on the Maine coast in 1871. Fortunately, some forty-odd specimens are known to be in museums and in private collections.

PACIFIC EIDER (Somateria dresseri).

Range: Breeds from southern Ungava and Newfoundland to southeastern Maine, and on southern half of Hudson Bay; winters from Newfoundland and Gulf of St. Lawrence south on Atlantic coast regularly to Massachusetts.

The American eider is the eider of northeastern North America, and differs only slightly from its European representative, the "northern eider," from which is derived much of the eiderdown of commerce. The female anticipates the needs of her ducklings for a warm and soft bed by lining the nest with down plucked from her own breast. But this downy lining is coveted by the Icelanders, who regard the summer's crop of down as a substantial addition to their annual harvest and who accordingly appropriate it. The male, equally solicitous for the welfare of the nestlings, in turn denudes his breast of its down and replaces the lining. This also is taken, after which the pair are allowed to rear their brood in peace. Needless to say, the eider is carefully protected in Iceland, and hence the crop of down is a perennial one. This duck was formerly abundant and indeed nested along the coast from Maine northward. Eiders are much less numerous than formerly within our territory, for the sufficient reason that they have been ruthlessly killed. No doubt they would soon be extinct were it not for the fact that they breed in the north far from harm. The eider is a true marine duck and well deserves the title of "sea duck" bestowed upon it by gunners. So hardy are these birds that they choose to keep to the open sea during the severest storms, and rely for their preservation on their unsurpassed powers of swimming and diving. Eiders live largely upon mussels, which they secure in fifty feet or more of water. Dependent in no wise upon man and doing him no harm, they ask only for the universal boon of life.

KING EIDER (Somateria spectabilis) (See page 127).

WHITE-WINGED SCOTER (Oidemia deglandi).

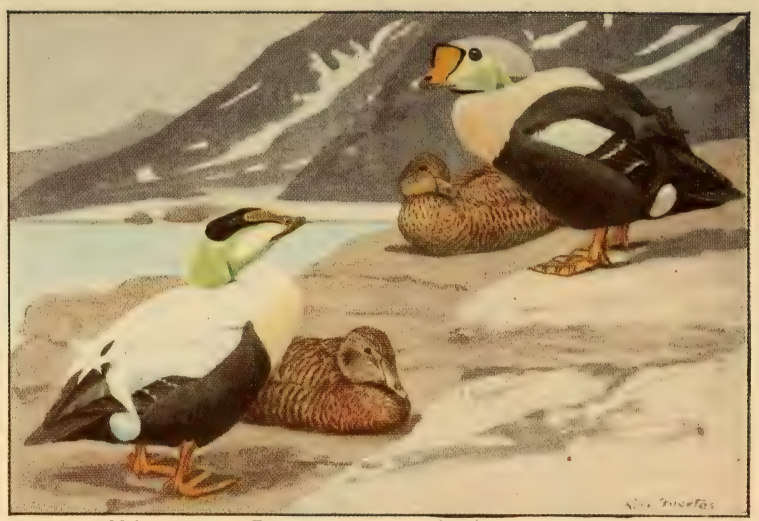
Range: Breeds from the coast of northeastern Siberia, northern Alaska, northern Mackenzie, and northern Ungava south to central British Columbia, Alberta, northern North Dakota, and southern Quebec; winters on the Asiatic coast to Bering Island, Japan, and China, and in North America from Unalaska Island to San Quintin Bay, Lower California, the Great Lakes, and the Atlantic coast from the Gulf of St. Lawrence south (rarely) to Florida; non-breeding birds occur in summer as far south as Rhode Island and Monterey, California.

The general habits of this scoter correspond closely with those of its relatives. It winters in great numbers in company with other coots on the coasts of the New England and Middle States, and also along our west coast, especially in Oregon and Washington. Scoters are denizens of the sea and are almost as much at home there as the fish, crustaceans, and shell fish upon which they feed. So large are some of the shell fish that have been found in their stomachs that it is difficult to understand how the birds manage to swallow them, and equally difficult to comprehend how they can digest the hard, thick, calcareous shell. This they do, however, with ease and celerity, and the digestive feat is one an ostrich might well be proud of.

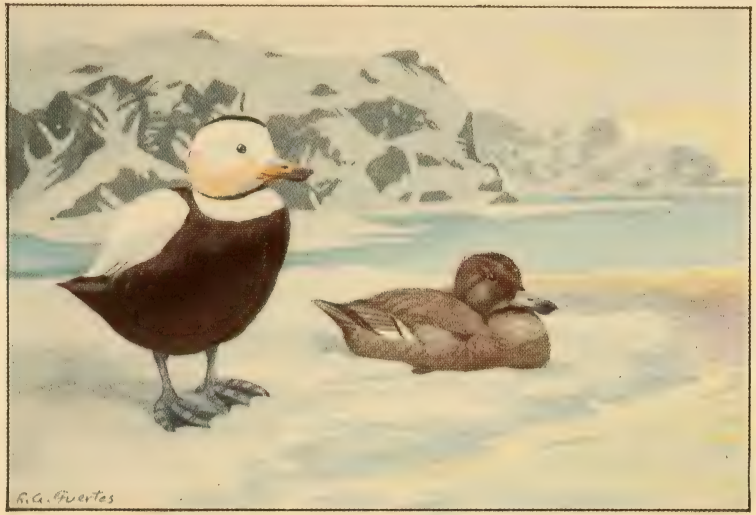
SURF SCOTER (Oidemia perspicillata) (See page 146).

AMERICAN SCOTER (Oidemia americana) (See page 146).

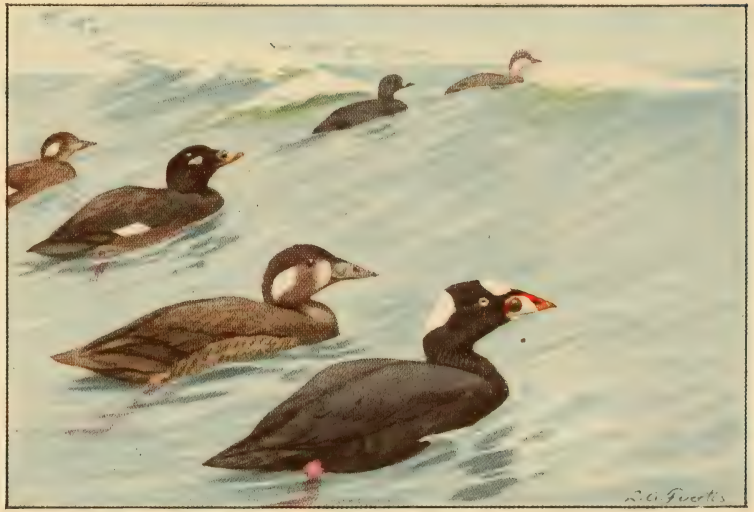
Female Male
STELLER'S EIDER SPECTACLED EIDER



Male Female Female Male
PACIFIC EIDER KING EIDER



Male Female
LABRADOR DUCK



Female Male Female Male Male Female
WHITE-WINGED SCOTER SURF SCOTER AMERICAN SCOTER

RUDDY DUCK (Erismatura jamaicensis).

Range: Breeds from central British Columbia, Great Slave Lake, southern Keewatin, and northern Ungava south to northern Lower California, central Arizona, northern New Mexico, northwestern Nebraska, southern Minnesota, southern Michigan, southern Ontario, and Maine; winters from southern British Columbia, Arizona, New Mexico, southern Illinois, Maine and Pennsylvania, south to the Lesser Antilles and Costa Rica.

The ruddy duck, or "dumb bird," as it is called in New England, alias the rook of the Potomac region, has a wide range in the United States from seacoast to seacoast, and formerly nested over much of this wide territory. That it is not unknown to sportsmen and others is attested by the fact that Trumbull in his "Names and Portraits of Birds" gives sixty-seven synonyms under which it appears. Some of these, as "deaf duck," "fool duck," "dumb bird," are indicative of its disposition; while others like "bull neck," "spine-tail duck," mark certain physical peculiarities. In appearance it is quite unlike any other duck, and when swimming, its plump, round body and uplifted tail serve to distinguish it to the merest tyro. It is extremely sociable and unites in large flocks, sometimes in company with other species. Over most of its range the little ruddy duck was formerly lightly esteemed for food, and consequently enjoyed comparative immunity from the pursuit of sportsmen and even from market gunners. As other more highly prized species diminished in numbers, the ruddy attracted more attention, and in waters like the Potomac River, where the rookies formerly gathered in fall by thousands, only a beggary remnant remains. Ruddies are the more easily killed because they do not readily take wing, but being expert divers endeavor, when pursued, to escape by diving. The gunner aware of this weakness has only to persist in pursuit of the birds, one after another, to secure most or all of a flock.

FULVOUS TREE-DUCK (Dendrocygna bicolor).

Range: Breeds from central California, middle-western Nevada, southern Arizona, and central Texas south to the Valley of Mexico and Michoacan; winters from central California and central Texas to southern Mexico.

The tree-ducks are tropical species, two of which, the black-bellied and the fulvous tree-duck, extend their range into the United States. In this country at least there is little to warrant the name of tree-duck, as the bird is no more arboreal, if as much so, than the wood-duck. No doubt it alights in trees in wooded districts, and very probably it occasionally nests in hollow trees, as do several others of our ducks; more often, however, it nests on the ground for the sufficient reason that much of the territory it inhabits is practically treeless. The only place in which I ever saw this species was Washoe Lake, Nevada, and there its habits are so similar to other ducks that frequent shallow lakes that at first I hardly recognized it. It is much more numerous in southern California than in Nevada, but migrates farther south in winter. This duck is credited with laying an unusually large clutch of eggs, from fifteen to thirty, but very probably the larger number is the result of two or more females laying in the same nest on a cooperative basis.

WOOD DUCK (Aix sponsa).

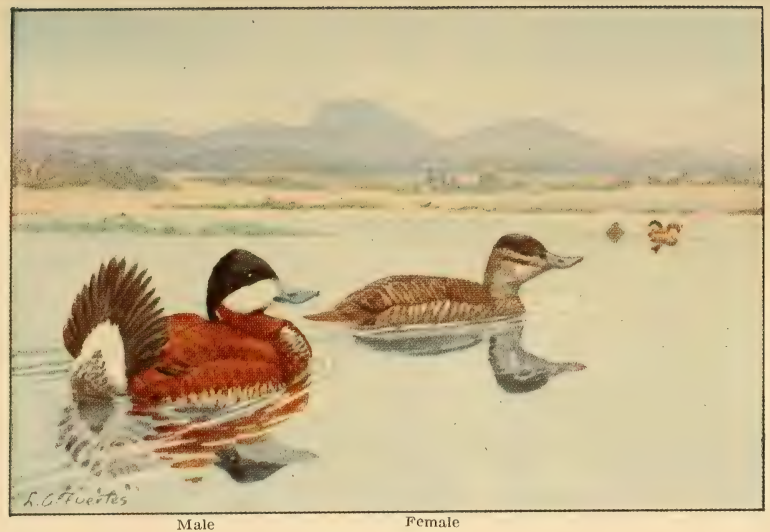
Range: Breeds from southern British Columbia, central Saskatchewan, northern Ontario, New Brunswick, and Nova Scotia south to central California, southern Texas, Florida, and Cuba; winters chiefly in the United States from southern British Columbia, Kansas, Illinois, Indiana, Pennsylvania, and New Jersey south to southern California and the Gulf of Mexico.

However divided the sportsmen of America may be on the many questions affecting their rights and privileges, they should one and all unite in an attempt to preserve the existence of the wood duck, perhaps the most beautiful of the duck tribe. It is true that in some sections of the country the wood duck is still far from uncommon, but no one conversant with the present state of affairs can examine the records of its former range and abundance without being convinced that the danger threatening the species is real and imminent; nor need recorded evidence alone be relied upon, for there are many sportsmen alive to-day whose memories go back to the time when this beautiful bird abounded in most of the wooded sections of eastern United States, where to-day few, if any, remain. A regulation under the Federal migratory bird law provides a closed season for the wood duck until 1918, and if this prohibition is faithfully observed, there is every reason to believe that the species will materially increase, more particularly as in States where it is wholly protected, or protected in spring, an increase in numbers has already been noted. It will be to our everlasting shame if this, one of the most perfect of Nature's creations, is allowed to meet the same fate as the passenger pigeon. Practically all the wood ducks nest and winter within our own boundaries and it is for us to say what shall be their fate.

WHITE-FRONTED GOOSE (Anser albifrons gambeli).

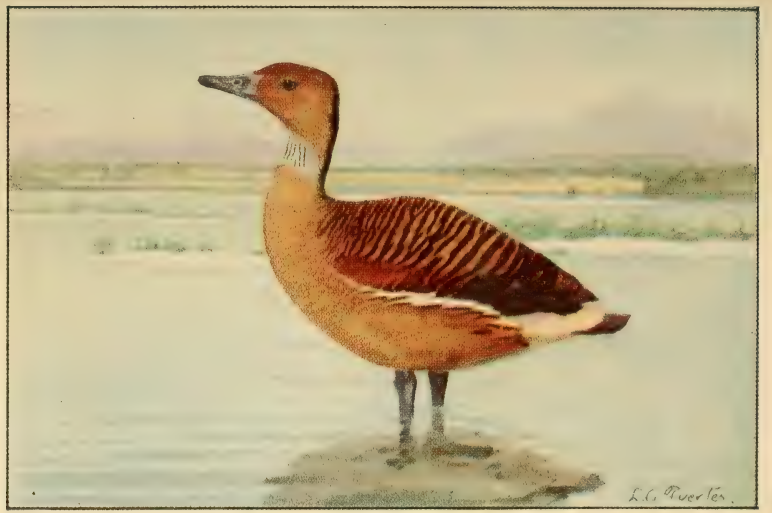
Range: Breeds on and near the Arctic coast from northeastern Siberia east to northeastern Mackenzie and south to lower Yukon Valley; winters from southern British Columbia to southern Lower California and Jalisco.

Though occasionally met with on the Atlantic coast and not uncommon in the Mississippi Valley, the white-fronted goose is essentially a bird of the far West, and is particularly abundant in the Pacific Coast States. This is one of the geese which used to visit the wheat fields of California in such numbers as to threaten the crop, and which men were hired to kill and frighten away. The hordes of former days are now represented by comparatively small numbers, and as the flesh is toothsome the problem of the near future is not how to destroy the birds most cheaply but what methods to employ to preserve them. White-fronted geese were found by Nelson breeding abundantly in the Yukon delta from the last of May till well into June. Their nests are placed on the grassy borders of lakelets, whence the young can be quickly led into the protecting water. In far-off Alaska this and the numerous other species of waterfowl that summer there in multitudes not only find comparatively safe solitudes in which to nest but, what is equally or more important, abundant food for themselves and their young. When they arrive in Alaska, late in April or early in May, according to the season, they find the previous year's crop of heath berries awaiting them in cold storage. Again in August and September the new crop of berries is ripe, and upon this the geese fatten and prepare themselves for the trip southward. Thus Alaska, the acquisition of which from Russia has more than fulfilled our expectations in many ways, proves to be the mecca of our waterfowl which, resorting there in spring by thousands, return in fall in fourfold numbers.

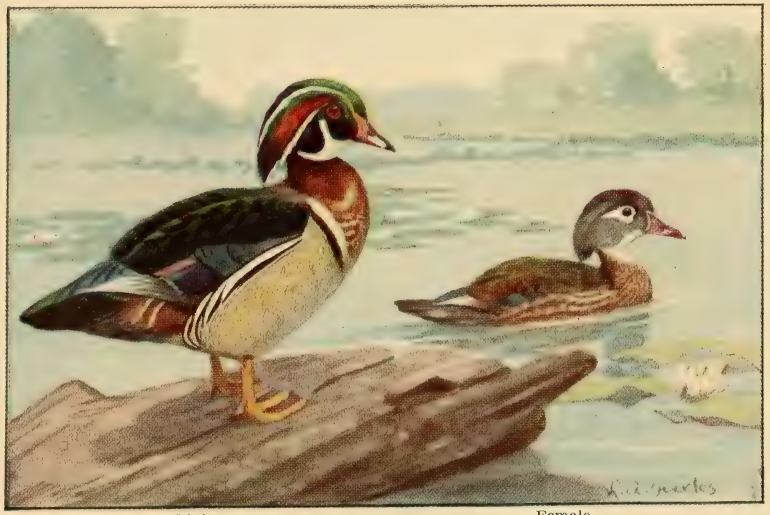


Male Female

RUDDY DUCK

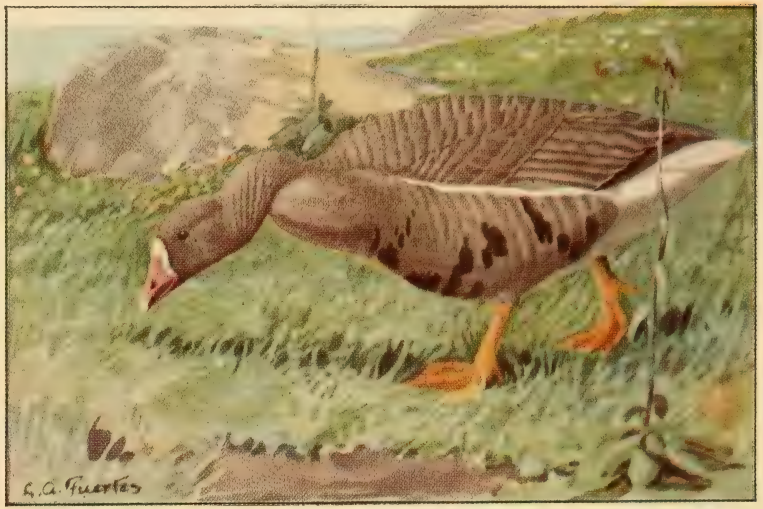


FULVOUS TREE DUCK



Male Female

WOOD DUCK



WHITE-FRONTED GOOSE

BLUE GOOSE (Chen cærulescens)

Range: Breeds probably in interior of northern Ungava; winters from Nebraska and southern Illinois south to coasts of Texas and Louisiana.

We know comparatively little of the life history of the blue goose. That it breeds in the far North is certain and it is surmised that it nests in the interior of Ungava. Few ornithologists have ever seen the bird, even in migration, though it is known to pass down the Mississippi Valley in considerable numbers. If, as is said, this goose migrates by night as well as by day, one reason for its apparent scarcity is evident. A new chapter was added to the bird's history when, in 1910, McAtee and Job found it wintering by thousands in the delta of the Mississippi River. These observers report that the geese were in such numbers as to inflict great damage on pasture lands. Like all its relatives, this species is a strict vegetarian and is particularly fond of the tender shoots of grass or grain. Eaton, in his "Birds of New York," after remarking that the blue goose is one of the rarest waterfowl which visits the waters of New York State, gives the following synonyms under which the bird is known locally: blue snow goose, blue-winged goose, blue wavy, white-headed blue brant, white-headed goose. The list would seem to indicate that at some time or other the goose was more widely distributed or better known than at present.

SNOW GOOSE (Chen hyperboreus hyperboreus) (See page 146).

BRANT (Branta bernicla glaucogastra).

Range: Breeds on the Arctic Islands north of latitude 74° and west to about longitude 100°, and on the whole west coast of Greenland; winters on the Atlantic coast from Massachusetts south to North Carolina.

The brant has a peculiar interest for eastern sportsmen since, while its nesting grounds are within the Arctic Circle, the bird winters on the Atlantic coast from New England south to North Carolina. Brant have always been favorite objects of pursuit by sportsmen, and many clubs have been formed the main object of which is brant shooting. Whatever be the cause, or the combination of causes, the brant is nowhere near as abundant as it was formerly, and while there would seem to be no danger of immediate extinction, a halt should be called on the indiscriminate destruction of the bird before it is too late. As pointed out by Forbush, while brant are well protected in summer by the remoteness and inaccessibility of their nesting grounds, the short Arctic season with the possibility of early storms exposes their young to great danger. One or more unfavorable breeding seasons in the Arctic, combined with the activity of sportsmen along the south Atlantic coast, might quickly jeopardize the safety of the species. The brant is not a diver and it procures its favorite food, eel-grass, when the tide is low, and when the rising water interferes with its activities it has to content itself with the floating fragments. Its apparent inability to dive for its food seems all the more remarkable since when wounded it not only can dive well but swim under water for a considerable distance. The flesh of the brant is usually excellent, although, as is the case with waterfowl generally, its flavor depends largely upon a variety of circumstances, especially upon the nature of its food for a few weeks prior to its being killed.

BLACK BRANT (Branta nigricans) (See page 146).

CANADA GOOSE (Branta canadensis canadensis).

Range: Breeds from the valley of lower Yukon, northwestern Mackenzie, and central Keewatin south to southern Oregon, northern Colorado, Nebraska, and Indiana; winters from southern British Columbia, southern Colorado, southern Wisconsin, southern Illinois, and New Jersey south to southern California, Texas, and Florida.

This, one of the largest of our waterfowl, is notable in many respects other than mere size. The wedge-shaped flocks of wild geese that, spring and fall, with melodious honking, wing their way respectively to their breeding and wintering grounds are a very familiar sight, and advertise in a most spectacular way that wonderful phenomenon—bird migration. The bird observer of speculative mind may find interest in answering the question—Why do geese usually fly in wedge formation? Is it because the powerful wings of the leader make easier the passage of those behind him or, as suggested by Forbush, does the wedge formation enable each individual member of the flock to see better?

Formerly the Canada goose, despite its name, nested in much of our territory and as far south at least as Massachusetts. To-day comparatively few geese nest within our borders, although flocks of goslings, convoyed by their parents, may still be seen on some of our western lakes. The "honker" is still far from extinct, and owes its present numbers both to the fact that it nests chiefly in the unfrequented territory of the far North, where its only enemies are the wild beast and the roving Indian, and to its wariness, the result of much and long-continued persecution.

CACKLING GOOSE (Branta canadensis minima) (See page 147).

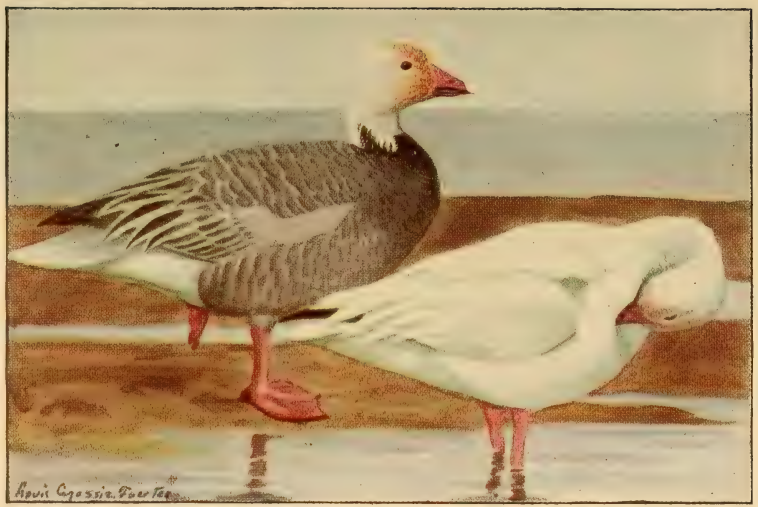
EMPEROR GOOSE (Philacte canagica) (See page 147).

TRUMPETER SWAN (Olor buccinator).

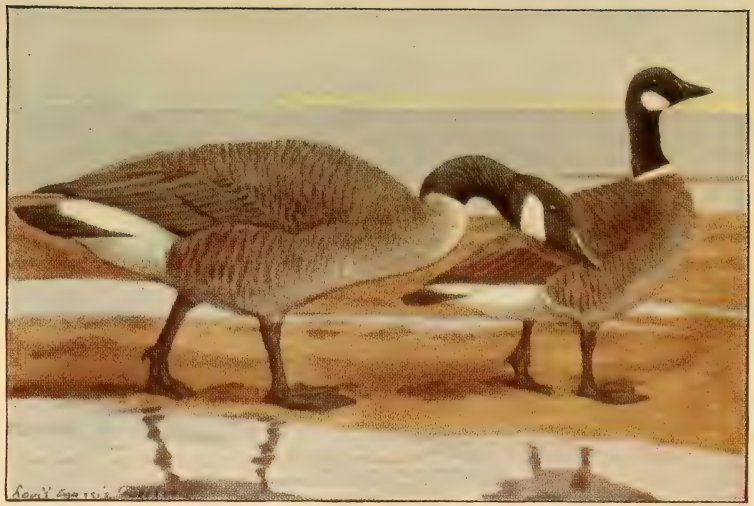
Range: Breeds from the Rocky Mountains to the western shore of Hudson Bay and from the Arctic Ocean to about latitude 60°; winters from southern Indiana and southern Illinois south to Texas, and from southern British Columbia to southern California.

This swan, the largest of American waterfowl, though by no means an infrequent visitor to both coasts, is by preference a resident of the interior where formerly it was very numerous. It used to nest in our northern tier of States west of the Mississippi, and Cooke states that it nested in Iowa as late as 1871. Its former breeding resorts were and still are in the region west of Hudson Bay. The bird, however, has become extremely rare, and there is little doubt that the days of the species are numbered. Several causes have contributed to this end. Swans are not divers and have to procure their food, mainly aquatic roots and grasses, in shallow water, their long necks greatly aiding them to secure the coveted delicacies three feet or so under the surface. Thus, when feeding, they are greatly exposed to attack by hunters who can pot them almost at will. Then, too, in the days of Hudson's Bay Company, swans' skins formed a regular article of trade with the Indians, who killed large numbers also for the pot. These may be considered contributory causes, but it was the shotgun and rifle in the hands of our gunners that settled the fate of this superb species.

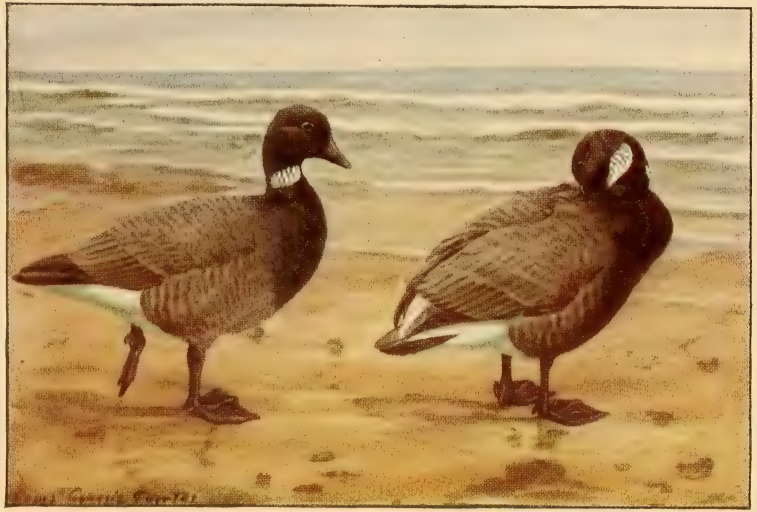
The whistling swan, a near relative of the trumpeter, and only a little smaller, has not suffered to the same extent, as it breeds farther north. Still it, too, has diminished greatly, and it must soon follow the fate of its larger relative.



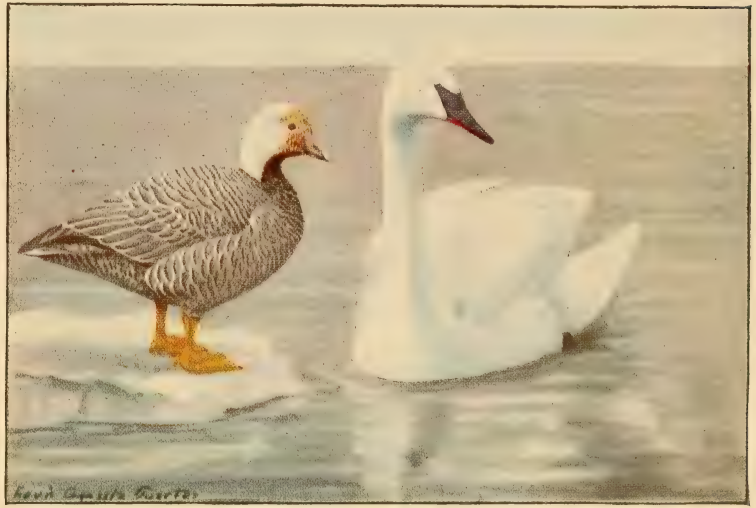
BLUE GOOSE SNOW GOOSE



CANADA GOOSE CACKLING GOOSE



BRANT BLACK BRANT



EMPEROR GOOSE TRUMPETER SWAN

WHOOPING CRANE (Grus americana).

Range: Mainly restricted to southern Mackenzie and northern Saskatchewan; winters from the Gulf States to central Mexico.

If we go back about a century we find this, the largest of our cranes, abundant and nesting over a vast area stretching from the Mackenzie region to Iowa, a strip 1,500 miles long by less than 300 miles wide. Cooke states that eggs of this species were taken in Iowa as late as 1894, and at Yorkton, Saskatchewan, as late as May 16, 1900. In its day and generation the whooping crane, big and conspicuous as it is, was common enough, as is attested by numerous authorities. Thus, Nuttall, speaking of a night on the Mississippi in December, 1811, says, "the whole continent seemed as if giving up its quota of the species to swell the mighty host. The clangor of their numerous legions, passing along, high in air, seemed almost deafening." To-day what a contrast! The clangor of passing multitudes no longer fills the air, for this noble bird, whose number was legion a century ago, is now practically extinct in the Atlantic States, while only a few pairs manage to maintain themselves in far out-of-the-way places, and so to delay for a few years the final extinction of the species.

In early colonial times the whooping crane was taxed with pillaging corn fields, and doubtless suffered for its crimes. Moreover, its flesh was reputed to be excellent, and no doubt this fact contributed to its destruction. One of the regulations under the Federal law fixes a closed season till 1918 for our three species of cranes, whooping crane, sandhill crane, and little brown crane, but, so far as this species is concerned, the regulation probably comes too late.

SANDHILL CRANE (Grus mexicana).

Range: Resident in Louisiana and Florida; bred formerly from southern British Columbia, Saskatchewan, Manitoba, and western Ontario south to California, Colorado, Nebraska, Illinois, and Ohio; winters from California, Texas, and Louisiana south to Mexico.

The big sandhill crane seems most at home on the broad expanse of the western prairies and marshes, which offer it food and security. It is still common, however, in Louisiana and southeastern Florida, where the prairies and savannas are large enough to suit its tastes. Thus, as pointed out by Cooke, the two breeding areas of this species are separated by a distance of more than 600 miles. As the crane struts majestically about, it keeps a watchful eye for enemies, and when the danger proves threatening, it spreads its broad wings and with measured beats flies slowly away. Its loud buglelike notes, when heard coming from mid-air, as the birds slowly pass out of sight, have a delightful musical quality. The food of this crane consists of a large variety of animal life, among which are grasshoppers and meadow mice, so that a distinct claim of economic usefulness may be made for it. Unfortunately for its safety its meat is by no means unpalatable and in some localities it is much sought after for food. Unquestionably, however, the restriction of its breeding and feeding grounds by settlement has had more to do with the decrease in its numbers than firearms. Probably the fate of such a large bird, requiring so much space and freedom, can not be averted, but it can at least be postponed, and every man who carries a gun should do his part by refraining from making a target of its big body.

Of the three species of cranes living in the United States the brown crane is the smaller and is confined to the Middle West.

KING RAIL (Rallus elegans).

Range: Breeds from Nebraska, southern Minnesota, Ontario, New York, and Connecticut south to Texas, Florida, and Cuba; winters mainly in the southern part of its breeding range.

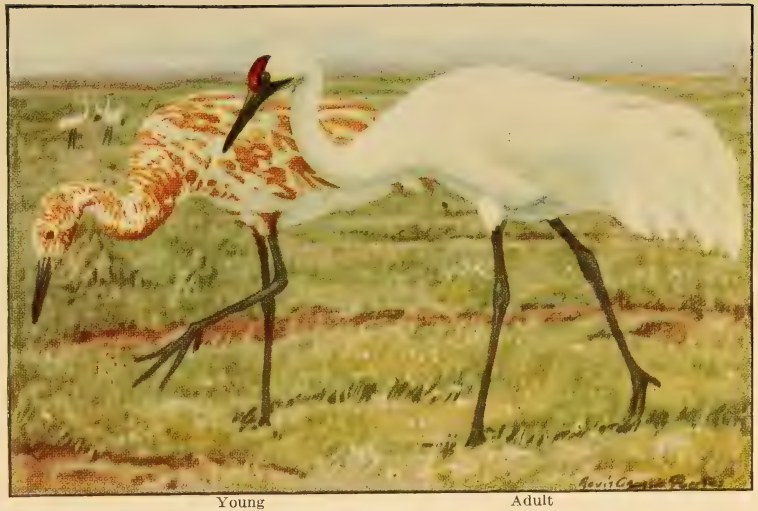
The king rail, the largest and handsomest of its family, is trim of form, moves with an air of conscious grace, and is tastefully garbed in soft brown and black, which harmonize wonderfully well with the vegetation of swamp and meadow, among which it passes its life. Moreover, it possesses in the highest degree that form of beauty which consists in the perfect adaptation of means to end, for its entire make-up is wonderfully in keeping with its mode of life. Anyone familiar with the appearance of the Virginia rail will recognize the king rail on sight since it is a near counterpart of that bird, except in size. It lives exclusively in fresh-water meadows where it hides in the thick cover after the manner of its kind. So adept is it at the game of hide-and-seek that, though you may mark one down to a foot, it is rarely that either man or dog can put it up a second time, though the cover may appear to be insufficient to conceal even a sparrow. When on the wing the bird appears to fly with great effort. As a matter of fact, it can fly well enough for all practical purposes, but it has a pair of stout legs quite capable of taking their owner out of harm's way under ordinary circumstances, and it usually prefers to entrust its safety to these members rather than to its wings. Apparently the rail is nowhere very numerous, but it is difficult to say how far this seeming scarcity of the bird is due to its secretive habits. As it is prolific, laying from seven to twelve eggs, and offering no great temptation either to the sportsman as a mark or to the gunner as a market bird, this handsome rail should long continue a denizen of our fresh-water marshes.

CLAPPER RAIL (Rallus crepitans crepitans).

Range: Breeds from Connecticut to North Carolina; winters mainly south of New Jersey.

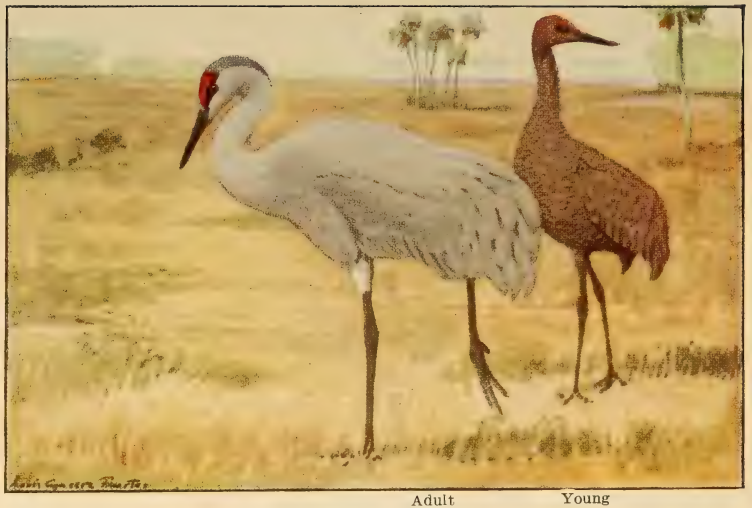
The distribution of the clapper rail complements that of the king rail, for the clapper inhabits the salt-water marshes as its relative does the fresh-water meadows. Though occasional as far north as Massachusetts, the clapper rail does not begin to be numerous until Long Island is reached. Farther south it inhabits the salt marshes in great numbers. It used to nest abundantly on Cobb's Island and other sandy islands along the Atlantic coast which are fringed on the landward side by dense beds of rushes. When on Cobb's Island, I once offered a small boy a quarter apiece for some of the young clappers, as I had never seen them. In about an hour he returned and to my astonishment turned out of his cap more than a dozen of the quaint, black, fluffy youngsters, some of which apparently had just chipped the shell. It appeared that an uncommonly high tide had driven the birds from their usual haunts, and the nestlings were to be had by the dozen by wading through the reeds and picking them off the piles of floating debris. I had the pleasure of returning most of them to their native haunts, and the rapidity with which they lost themselves among the reeds showed that they needed no parental lectures on the art of concealment.

A closely allied species, the California clapper rail, represents the eastern bird on the Pacific coast of Oregon and California. As the name implies, clapper rails are noisy birds, and their harsh notes are often heard coming from the thick reeds when the callers are invisible. They lay from seven to a dozen eggs and are so prolific that with a decent regard for seasons and bag limits, they should hold their own to the end of time.



Young Adult

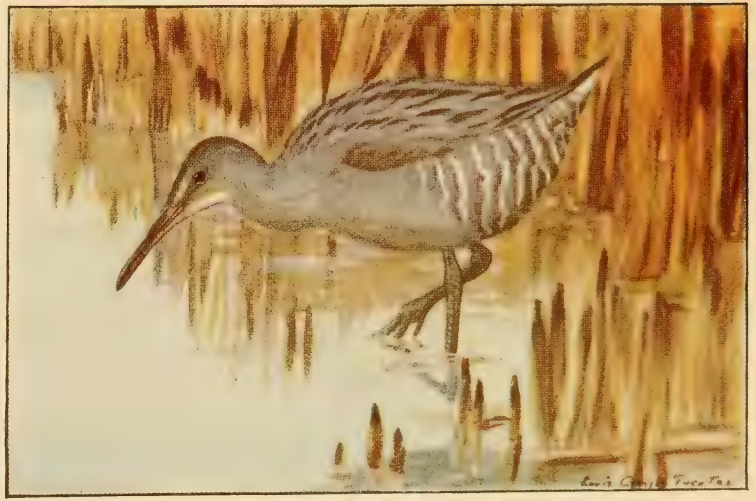
WHOOPING CRANE



Adult Young

SANDHILL CRANE

KING RAIL



CLAPPER RAIL

SORA (Porzana carolina).

Range: Breeds from central British Columbia, southern Mackenzie, central Keewatin, and Gulf of St. Lawrence south to southern California, Colorado, Kansas, Illinois, and New Jersey; winters from northern California, Illinois, and South Carolina through the West Indies and Central America to Venezuela and Peru.

Though distributed generally throughout the United States and breeding in fresh-water meadows almost everywhere, the sora is far more abundant east of the Mississippi than west of it. However abundant it may be, its chosen haunts of swamp and meadow are so rarely visited and the bird is of such secretive habits that it may abound in a given neighborhood and few be aware of the fact. Towards the nesting season the sora becomes garrulous, and its low, whistled notes form a pleasant addition to the early summer chorus that comes from the reedy recesses. Even in fall one has only to make an unusual noise near a sora swamp, as a sharp tap of the paddle on the boat, to elicit a chorus of protesting "kuks," which announce the presence of hundreds of the rails. But it is as a tidbit for the table and as a game bird that the sora is best known in the Atlantic States, where sora shooting is looked forward to as an annual experience not to be lightly foregone. Wherever wild rice abounds there the rails congregate by thousands to feed on the ripening grain. At high tide the gunner in a light skiff is poled among the reeds, and as the birds rise, sometimes a dozen at a time, they form easy marks. Every fall many thousands of the rails are killed and, although the birds lay from eight to fifteen eggs, soras are steadily decreasing.

PURPLE GALLINULE (Ionornis martinicus).

Range: Breeds from Texas, Tennessee, and South Carolina south through Mexico and the West Indies to Ecuador and Paraguay; winters from Texas, Louisiana, and Florida southward.

The bright colors of the purple gallinule suggest a tropical origin, and the bird in fact is far more at home in tropical lands than in temperate climes. It not only runs nimbly and with grace over the leaves and stems of floating aquatic vegetation, but swims and dives well, and when suspecting danger progresses under water with only the bill visible. The general habits of the two gallinules are very similar.

FLORIDA GALLINULE (Gallinula galeata).

Range: Breeds from central California, Arizona, Nebraska, Minnesota, Ontario, New York, and Vermont south through the West Indies and Mexico to Chile and Argentina, and in the Galapagos and Bermuda; winters from southern California, Arizona, Texas, and Georgia southward.

Although in no proper sense of the word a game bird, the Florida gallinule looks so much like a rail or a coot, and moreover so commonly frequents the same general localities as these birds, that it is frequently mistaken by the gunner and shot. Although it inhabits the Florida swamps, it is by no means restricted to that State, but possesses a wide range westward to the Pacific, northward as far as Massachusetts, and south well into the tropics.

The gallinule's habits are a combination of duck, coot, and rail, and the bird is most at home amid the tangle of vegetation that grows on the borders of fresh-water ponds, where it is careful to keep well concealed during the hours of daylight. After dusk gallinules feel safe in the open, and then may often be seen swimming across broad stretches of open water. The gallinule has little to commend it for the table, and as it is absolutely harmless, sportsmen will do well to acquaint themselves sufficiently with its appearance to avoid shooting it by mistake.

VIRGINIA RAIL (Rallus virginianus).

Range: Breeds from British Columbia, southern Saskatchewan, southern Keewatin, Ontario, southern Quebec, and New Brunswick south to southern California, Utah, Kansas, Missouri, Illinois, New Jersey, and eastern North Carolina; winters from Oregon, Utah, and Colorado to Lower California and Guatemala; also in the Lower Mississippi States, and from North Carolina to Florida.

The Virginia rail is a denizen of both fresh- and brackish-water marshes, though with a decided preference for the former, especially in the nesting season. Its thin, wedge-shaped body eminently adapts it for a life among sedge and tule, through the stems of which it glides so swiftly and noiselessly that the sharpest-eyed observer rarely catches a glimpse of it. Where notified of its presence by its grunting notes, which Brewster aptly compares to the sounds of a hungry pig, one has only to sit down in a favorable spot and patiently await the time when our brown Knight of the Reeds steps daintily forth into the open in search of food and sunlight. He is never quite at home, however, outside the friendly shelter of reeds and grasses, and in the open ever betrays by his alert actions the consciousness of possible danger. The slow, wavering flight of this rail appears to betray the novice. Nevertheless, these same wings that seem to be overtaxed in a flight of fifty yards or so are capable of carrying their owner over long distances in migration. Cooke thinks that many soras cross the Gulf of Mexico in their passage to South America, and the Virginia rail is probably capable of an equally protracted flight. The distance in fact between its extreme habitat, southern Canada and Guatemala, is approximately 2,100 miles. All rails migrate by night and as a rule fly low, as though conscious of their inferior wing powers.

COOT (Fulica americana).

Range: Breeds from central British Columbia, southern Mackenzie, Manitoba, Quebec, and New Brunswick south to northern Lower California, Texas, Tennessee, and New Jersey; also in southern Mexico, southern West Indies, and Guatemala; winters from southern British Columbia, Nevada, Utah, the Ohio Valley, and Virginia south to Colombia.

Though neither a rail nor a gallinule, "Blue Peter" belongs to the same family as these birds, and if habits and appearance are taken into account, may be considered a sort of connecting link between the rails and the ducks. His waxy, white bill, and his lobed feet may be depended upon to distinguish him from the rest of the rail family and also from all other birds. He swims well and also is a good diver, though he never essays great depths. Coots are extremely sociable, even in the nesting season, and where one pair is, more may be expected. Their nests are bulky structures of reeds and grasses floating on the water, and are kept from drifting away only by the rushes among which they are built, and which serve both to anchor and to conceal them. Fortunately for themselves, coots are little esteemed for food and, indeed, in most parts of the United States are contemptuously ignored by sportsmen. As a consequence, "Blue Peter" still flourishes in the rivers and ponds of some sections of the United States, although in reduced numbers.

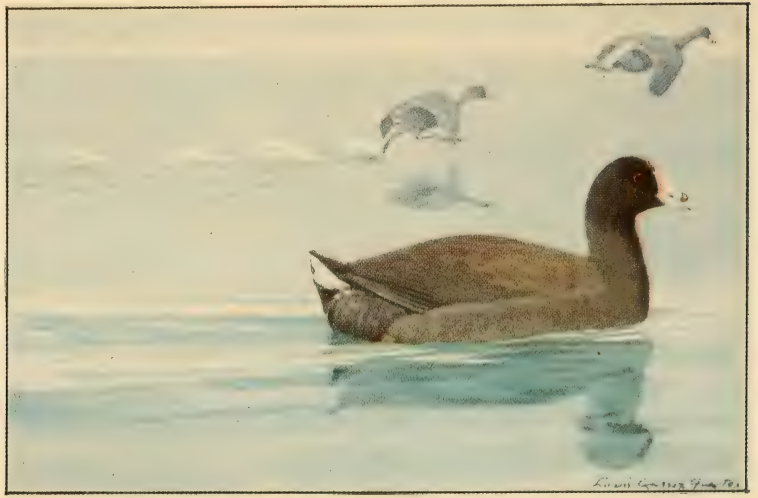
This was one of the few waterfowl to discover the Hawaiian Islands, that little archipelago in mid-ocean, 2,000 miles from Alaska, whence the birds originally came. So well satisfied were the early explorers with their new discovery that they founded a permanent colony in Hawaii, and still exist in considerable numbers, having changed very little in appearance and not at all in habits.

Adult Young

SORA

VIRGINIA RAIL

PURPLE GALLINULE FLORIDA GALLINULE



COOT

HOODED MERGANSER (Lophodytes cucullatus) (See page 109).

Range: Breeds from central British Columbia, Great Slave Lake, central Keewatin, central Ungava, and Newfoundland south to southern Oregon, northern New Mexico, southern Louisiana, and central Florida; winters from southern British Columbia, Utah, Colorado, Nebraska, Illinois, Indiana, Pennsylvania, and Massachusetts south to Lower California, Mexico, and the Gulf States.

This, the smallest and most beautiful of the mergansers, ranges from Alaska to Mexico, and formerly was abundant in the East where it nested in many States, including New England. Of late years it has diminished greatly in numbers, as would be expected of a bird of its habits. Unlike its near relatives, it prefers still-water ponds and rivers, and is often found in company with the wood duck. Its flesh is said to have little of the unpalatable fishy flavor of its congeners, and this would seem to imply a more varied diet, including probably seeds and grasses. Nevertheless, nature did not endow the merganser with the serrated bill of its kind without a purpose, and its skill in diving and seizing its finny quarry proves that fish, or at least aquatic creatures of some sort, are its natural food. The hooded merganser nests in hollow trees, sometimes thirty or more feet up, and the wonder is how the tiny ducklings find their way to the nearest water as they certainly do in a very few hours after emerging from the egg. Sometimes the mother may act as a common carrier for her brood, and again, when the height is not too great, the ducklings may drop to the ground or water as the case may be.

GADWALL (Chaulelasmus streperus) (See page 111).

Range: Breeds from southern British Columbia, central Alberta, and central Keewatin south to southern California, southern Colorado, northern Nebraska, and southern Wisconsin; winters from southern British Columbia, Arizona, Arkansas, southern Illinois, and North Carolina south to southern Lower California, central Mexico (Jalisco), and Florida.

Though seemingly as well fitted for the struggle for existence as any of its fellows, the gadwall apparently was never very abundant in any part of its range. Formerly it was not uncommon in New England and in the Middle and Eastern States, but for a quarter of a century or more the bird has been practically unknown to the sportsmen of the Atlantic seacoast, though still found in considerable numbers in Texas, and other Western States. I have never seen the gadwall in large flocks, but usually singly or by twos or threes in company with ducks of other species, and such seems to have been the experience of many other observers. It is a denizen of fresh water and is fond of shallow lakes and ponds, where its habits somewhat resemble those of the mallard. It is a good diver when the need arises, but usually finds little occasion for the exercise of its skill, since it frequents the shallow margins of ponds and lakes in company with mallards and other species. I have frequently seen the gadwall literally stand on its head in shallow water grubbing for food on the muddy bottom, when only its feet and the tip of its tail were sticking out. Its bill of fare is varied and includes aquatic grasses, seeds, nuts, insects, mollusks, in short almost any edible substance it can obtain.

SHOVELLER (Spatula clypeata) (See page 111).

Range: Breeds from northwestern Alaska, northwestern Mackenzie, and southern Keewatin south to southern California, central New Mexico, northern Texas, northern Missouri, and northern Indiana; winters from southern British Columbia, Arizona, New Mexico, southern Missouri, southern Illinois, Maryland, and Delaware south to the West Indies and Colombia.

The shoveler is cosmopolitan in its range and, while no longer common in the Eastern States, it is still numerous in several States of the far West where it breeds. The shoveler likes reedy ponds and sloughs, where it grubs in the shallows, and obtains a rich feast of insects, tadpoles, worms, and larvæ of various kinds, which its shovel-shaped bill seems expressly designed to enable it to scoop up and strain out of the reedy ooze. By many it is accounted one of our best table-ducks. And as it is not shy and is often killed in large numbers, it has suffered a notable decrease in numbers. The shoveler is a swift flier and is capable of enduring flight, as is apparent from the fact that annually it finds its way from Alaska over the 2,000 miles of intervening ocean to the Hawaiian Islands. There it winters, and the few that escape the ardent pursuit of the island sportsmen retrace their way across the tractless ocean in spring for the purpose of nesting.

CINNAMON TEAL (Querquedula cyanoptera) (See page 111).

Range: Breeds from southern British Columbia, southwestern Alberta, southeastern Wyoming, and western Kansas south to northern Lower California, northern Chihuahua, southern New Mexico, and southwestern Texas; winters from southern California, central New Mexico, and southern Texas south to southern Lower California and central Mexico.

Though a stray individual the cinnamon teal is occasionally seen east of the Mississippi, and though the bird is known to breed as far east as western Kansas, the true home and center of abundance of this species is west of the Rocky Mountains. Its favorite resorts in summer are the extensive marshes that surround shallow fresh or alkali lakes. Well within the recesses of these, it selects a dry spot and on it builds its nest. When the young are hatched they are led by the anxious mother to the shelter of the tall tulles that surround these inland lakes by a broad strip of dark green, and here they are safe, at least from most four-footed enemies. Though the cinnamon teal summers to some extent in British Columbia, and a greater or lesser number winter south of our borders, as a species the teal may be said to pass its life within our boundaries. At present it does not receive adequate protection at any season of the year, and in many places large numbers are killed before they can fly. If thoroughly protected during the summer and if reasonably protected at other seasons, the teal will hold its own indefinitely, or until, in the interests of agriculture, all its marshy fastnesses have been turned into ploughed fields which, fortunately for waterfowl and bird lovers, will not be for many years to come.

LESSER SCAUP DUCK (Marila affinis) (See page 113).

Range: Breeds from Yukon Valley, Alaska, and Fort Anderson, Mackenzie, south to central British Columbia, southern Montana, Colorado (casually), northern Iowa, northern Indiana, and western Lake Erie; winters from southern British Columbia, Nevada, Colorado, Lake Erie, and New Jersey south to the Bahamas, Lesser Antilles, and Panama.

So closely do the two scaups or blue-bills resemble each other and so similar are their general habits that, except as regards their distribution, what is said of one applies almost equally well to the other. Like its congener, the lesser scaup is prone to associate in immense flocks, and on this account is sometimes called the "raft duck." Because of this habit and because it decoys well, this scaup is a favorite with gunners, and immense numbers are killed every season and find their way to the markets. Naturally they are nothing like so numerous as formerly though, everything considered, they still hold their own fairly well. I found the lesser scaup abundant in Florida and in the Gulf States in winter in the early seventies, and Chapman thinks they are more southern in their winter distribution than is the greater scaup. This species ranks among our best divers and its food habits are such as to insure it a warm welcome on the table of the epicure. It is very fond of wild rice, and in fall, when the crop of this grain ripens, frequents the inland lakes by thousands, and soon becomes fat on this nutritious diet. In protected waters it it surprising how soon this duck and its congener, the greater scaup, become tame. I have often approached flocks within half a gun shot that were apparently quite indifferent to my presence, and yet elsewhere the same individuals were wary enough to insure their own safety. No doubt the scaups would readily lend themselves to semi-domestication.

RING-NECKED DUCK (Marila collaris) (See page 113).

Range: Breeds from southern British Columbia to northern California, and from northern Alberta and Lake Winnipeg south to North Dakota, northern Iowa, and southern Wisconsin; winters from southern British Columbia, New Mexico, northern Texas, southern Illinois, and New Jersey south to Porto Rico and Gautemala.

So much alike are the ring-neck and the lesser scaup in size, flight, and general appearance that it is only when the sportsman has bagged his bird that he can fully assure himself of its identity. Without doubt the ring-neck is much more uncommon in the Atlantic States than formerly, though Chapman states that in winter it is still abundant on the Florida fresh-water lakes. It is fairly numerous in migration in the far West in the marshes of large ponds and lakes, and still continues to breed in considerable numbers in Minnesota and North Dakota and perhaps elsewhere in our northern frontier States. I have never seen the ring-neck in large flocks, so characteristic of the scaups, and usually have observed it either in small companies consisting exclusively of its own species, or associated in large flocks of other species, and such, I believe, has been the experience of most other observers. The ring-neck has no fondness for salt water, but is preeminently a fresh-water species. Like other members of the genus it is an excellent diver, and where wild celery is to be had, gets its share of the coveted grass. In point of excellence for the table it may be ranked with the two scaups, but does not equal the redhead or canvas-back.

SPECTACLED EIDER (Arctonetta fischeri) (See page 117).

Range: Breeds in Alaska from Point Barrow to mouth of Kuskokwim, and on the northern coast of Siberia west to mouth of Lena River; winters on Aleutian Islands.

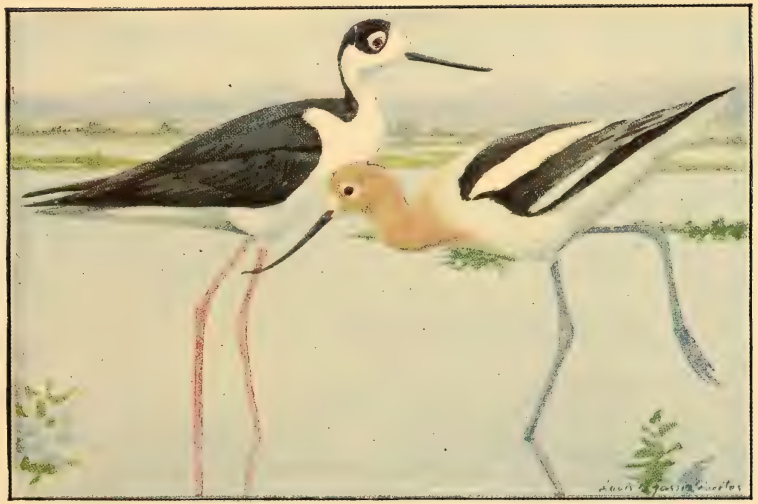
Nelson's observations show this species to be strictly limited to the salt marshes bordering the east coast of Bering Sea, and thus favoring the shallow, muddy, coast waters, which appear so distasteful to Stellar's eider. The same observer estimates that, all told, the spectacled eider does not occupy over 400 miles of coast line in the breeding season, while the width of the breeding ground will not exceed one or two miles. Writing as long ago as 1881, Nelson said of the struggle for existence the species was even then undergoing: "The species has to contend against thousands of shotguns in the hands of the natives. The diminution in all the species of waterfowl breeding along the coast is more and more marked each season, and while this may mean a desertion of one region for another in the case of the great majority of geese and ducks, yet for such narrowly-limited species as the spectacled eider, and to a less extent the emperor goose, this diminution is but the beginning of extermination; moreover, the present scarcity of large game along the coast is having great effect in causing the natives to wage a continually increasing warfare upon the feathered game."

KING EIDER (Somateria spectabilis) (See page 117).

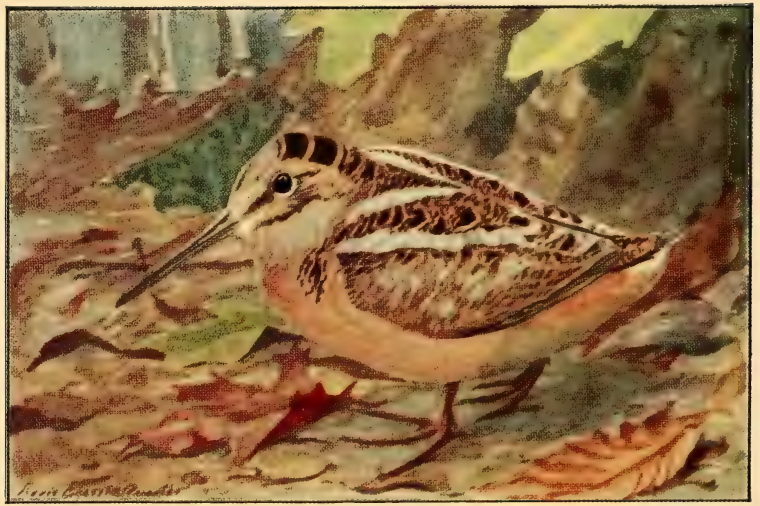
Range: Breeds along coast of northern Siberia and Arctic coast of America from Icy Cape east to Melville Island, Wellington Channel, northern Greenland, northwestern Hudson Bay, and northern Ungava; winters on Pacific coast from Aleutian Islands to Kodiak Island, in the interior rarely to the Great Lakes, and from southern Greenland and Gulf of St. Lawrence south regularly to Long Island.

The king eider is a resident of Arctic realms, and visits the Great Lakes and our North Atlantic coast only in winter. At Point Barrow, on the Arctic coast, Murdock found this the most abundant bird, but even there it occurred chiefly as a migrant. The king eider is almost as much at home in the water as a fish, and is able to keep to the open sea during the severest winter weather. In fact, probably the bulk of the species never migrate at all, or only move south a sufficient distance to reach permanent open water. The bird feeds largely upon mussels, and as the beds are in deep water all its natatorial powers are brought into play in diving for its daily fare. It has actually been taken in the gill nets of fishermen in more than 150 feet of water, as Eaton states, a fact which sufficiently attests its skill and hardihood, more particularly as the water at this season is icy cold.

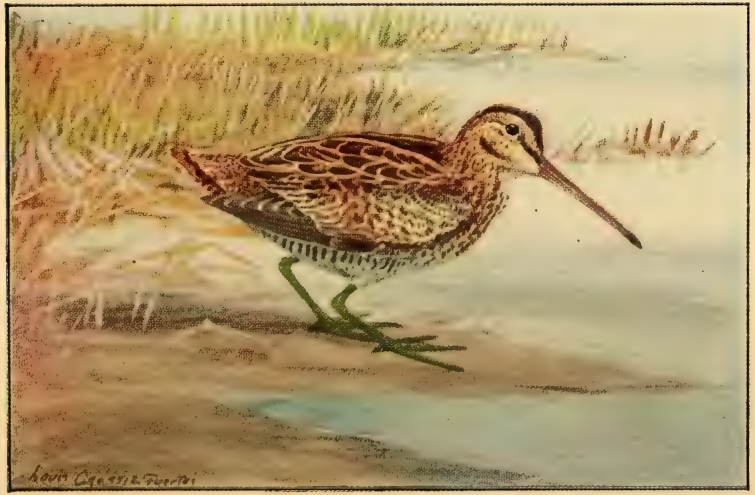
Like its relatives, it nests among rocks and bushes. The eiders are not so prolific as many of our smaller ducks, and this one commonly lays only five or six eggs. The king eider is one of the species the Icelanders depend on to furnish the harvest of down which is one of the important crops gathered by these northern people. The Icelanders are not the only ones who are dependent on this and other eiders for the necessities of life, for as Nelson tells us "the skins of all the eiders, but especially of this species and the Pacific eider, are used in making clothing by the Alaskan Eskimo, and the skin of the female, split down the back, with head, legs, and wings removed, is a very common article of foot-wear. It is used inside of the sealskin boots, and is very comfortable in winter."



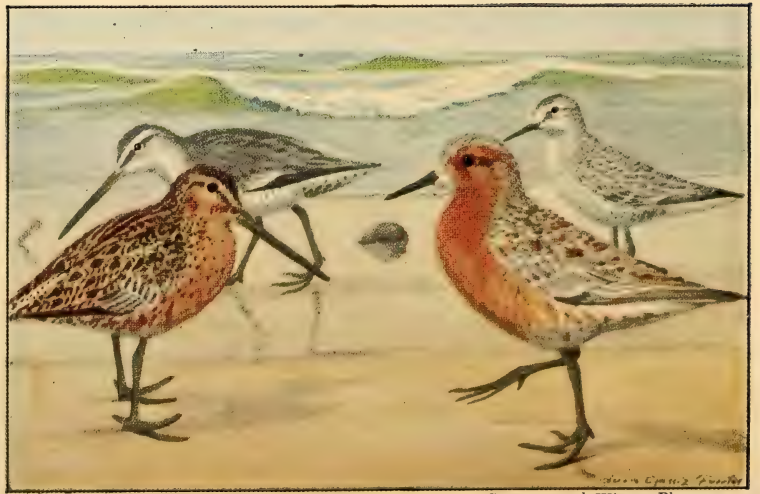
BLACK-NECKED STILT AVOCET



WOODCOCK



WILSON'S SNIPE



Summer and Winter Plumage
DOWITCHER

Summer and Winter Plumage
KNOT

BLACK-NECKED STILT (Himantopus mexicanus).

Range: Breeds from central Oregon, northern Utah, and southern Colorado to southern California, southern New Mexico, southern Texas, coast of Louisiana, and in Mexico, and from central Florida and Bahamas throughout the West Indies to northern Brazil and Peru; winters from southern Lower California, southern Texas, southern Louisiana, and southern Florida south through Central America and the West Indies to northern Brazil, Peru, and the Galapagos.

So commonly associated are the stilt and avocet and so similar are the general habits of these two very dissimilar species that the same account applies almost equally well to both. Like the "blue stockings," the stilt used to be rather common in the Atlantic States, but it has suffered at the hands of gunners till few of the present generation know the bird by sight. In 1871 I saw a lone stilt in Florida at the head of the Miami River, where it debouches from the Everglades—my sole experience with the species east of the Mississippi. But in the far western States I have seen many hundreds leading their natural lives by lakeside or slough in company with avocets. Even the most unobservant could not compare the general structure of these two species and not draw the inference that their habits must be very similar. The long bill of the stilt, indeed, is straight instead of being curved, but otherwise the stilt is as well equipped as the avocet to wade in shallow waters and extract a living beneath the muddy surface. It is true that its toes are not webbed, but our stilt seems not to have discovered its deficiency in this respect, and, when deep water intervenes, launches in with confidence born of long experience.

AVOCET (Recurvirostra americana) (See page 147).

WILSON'S SNIPE (Gallinago delicata).

Range: Breeds from northwestern Alaska, northern Mackenzie, central Keewatin, and northern Ungava south to northern California, southern Colorado, northern Iowa, northern Illinois, Pennsylvania, and New Jersey; winters from northern California, New Mexico, Arkansas, and North Carolina to Colombia and southern Brazil.

Wilson's or the English snipe is a bird of fresh-water swamp and meadow, in which it finds concealment among the grass or grassy tussocks. It is particularly fond of places where the soil is boggy enough to permit probing with its sensitive bill, for it finds much of its food beneath the surface in the shape of succulent worms. Owing to the nature of its haunts and its secretive habits, the snipe is familiar to but few outside the guild of sportsmen. Even nature lovers know the bird chiefly by its sharp "scaip, scaip," as it flushes suddenly from among the grasses. So quickly does the snipe get under way that one is apt to catch only a glimpse of a brown and black body as it cuts the air on powerful wings with many a twist and turn. It is this peculiar flight that endears the snipe to the sportsman, since a steady hand and a quick eye are needed to stop the bird when bent on escaping from a dangerous neighborhood. Most States until recently have permitted spring snipe-shooting. The practice is held by many to be the more excusable inasmuch as some States get little or no snipe-shooting in fall, and to forego spring shooting means no snipe-shooting at all in such States. No one, however, who has marked the steady decline in the number of snipe that migrate across our territory can doubt that the continuance of spring shooting means the extinction of this highly-prized game bird.

WOODCOCK (Philohela minor).

Range: Breeds from northeastern North Dakota, southern Manitoba, northern Michigan, southern Quebec, and Nova Scotia south to southern Kansas, southern Louisiana, and northern Florida; winters from southern Missouri, Ohio Valley, and New Jersey south to Texas and southern Florida.

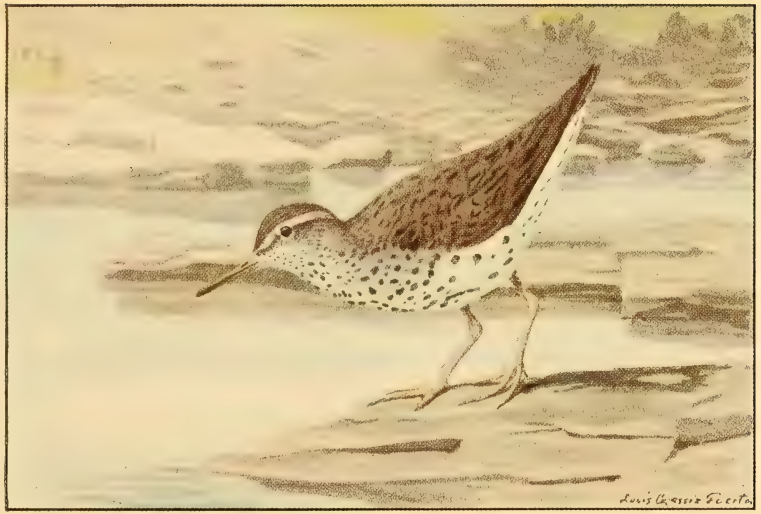
The woodcock, another member of the royal family among game birds, is practically the exclusive property of the American people to deal with as they list. It is true that a greater or lesser number of woodcock cross our northern frontier to breed, but the bulk of the species never leave our own borders. As a prerequisite to its presence the woodcock requires soft, moist earth in which to probe for earthworms, and its range may be said to be largely determined by the presence or absence of its favorite food. Study him at what season you will, meet him where you may, the woodcock is always an interesting bird. His spring-flight song, given as the hours of darkness approach—for the woodcock is chiefly of nocturnal habits—is unique among the long-billed, long-legged fraternity, and the many details connected with his housekeeping are well worth attention. And what music so sweet to the sportsman's ears as the silvery whistle of the woodcock's wings when the bird, suddenly roused from his snug shelter beneath bush or bracken, mounts upward through the silver birches! Nor is any other prize among game birds so dear to the sportsman's heart as this many-hued denizen of swamp and hillside when brought to bag in fair, sportsmanlike fashion. All the more keenly then must sportsman and bird lover regret the fact that the woodcock is passing. While there is no present danger of extinction, spring and summer woodcock-shooting should be abolished as a crime alike against a fine game bird and fair sportsmanship.

DOWITCHER (Macrorhamphus griseus griseus) (See page 147).

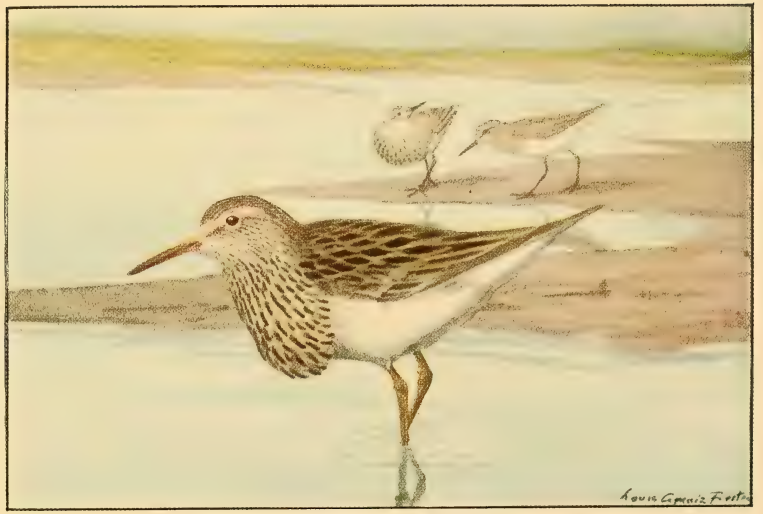
KNOT (Tringa canutus).

Range: Breeds from northern Ellesmere Land south to Melville Peninsula and Iceland; also on Taimyr Peninsula, Siberia; winters south to southern Patagonia, and from the Mediterranean to South Africa, India, Australia, and New Zealand.

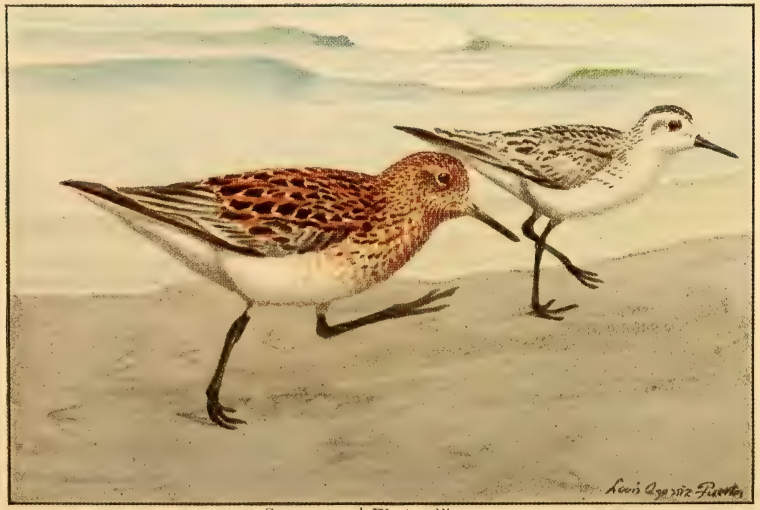
The knot is cosmopolitan in range and occurs on every continent and on many islands, large and small. It is strong of wing, and when migrating appears not to regard distance, for it spans the territory that separates Grinnell Land and the Straits of Magellan. It is a characteristic bird of the sea beach, and its food is obtained by following the receding waves and seizing the minute crustaceans and mollusks momentarily uncovered by the surf. Apparently, the robin snipe never was so abundant on the Pacific coast as along the Atlantic, but the species promises to last longer on the Pacific because less persecuted there. Enormous bags were formerly made on the eastern coast, more particularly during the last of May and early June. Thus the birds were pursued not only in fall but till near the opening of the nesting season, a sufficient cause of their diminution. In further explanation of the present small numbers of the knot, however, the fact counts for much that until recently there have been practically no bag limits for our shorebirds, and many gunners have shot as long as the birds and their ammunition lasted. All shorebirds that associate in large flocks are unsuspicious, as though safety lay in numbers. When the sportsman is to be reckoned with the reverse is true. Easily decoyed by wooden stools, or by the whistled imitation of their own note, or that of the black-bellied plover, a flock of robin snipe will swing in to within gunshot, and repeat the dangerous experiment two or three times, or until the flock is reduced to a few survivors.



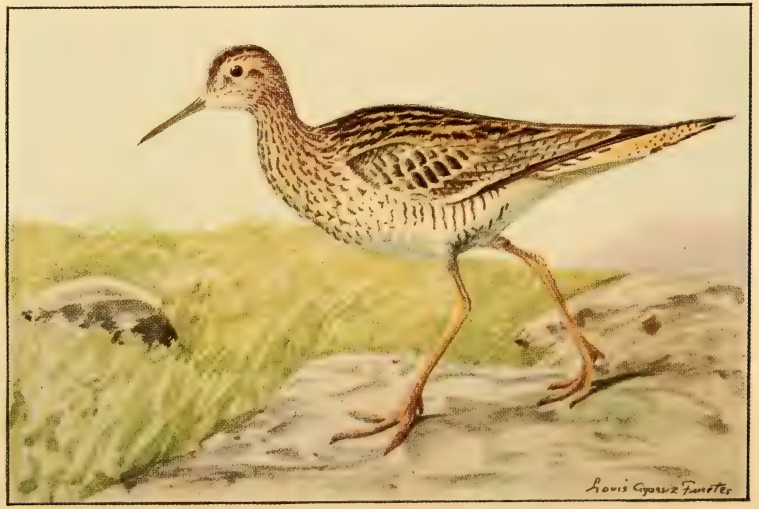
SPOTTED SANDPIPER



PECTORAL SANDPIPER



Summer and Winter Plumage
SANDERLING



UPLAND PLOVER

SPOTTED SANDPIPER (Actitis macularia).

Range: Breeds from tree limit in northwestern Alaska, northern Mackenzie, central Keewatin, northern Ungava, and Newfoundland south to southern California, Arizona, southern Texas, southern Louisiana, and northern South Carolina; winters from California, Louisiana, and South Carolina to southern Brazil and central Peru.

This ubiquitous little sandpiper is probably better known to the residents of the United States than any other of its kind. From Alaska to Florida it may be looked for with confidence along the seashore or wherever river, pond, or slough offers it food and congenial surroundings. The sound of its sweet "weet weet" often announces its presence in the most unexpected places. As if its ordinary every-day activities were not sufficient for its energetic little body, it incessantly bows its head and teeters its tail, and so honestly comes by its vernacular name of "tip up" or "teeter." Unlike most of its kin this sandpiper never assembles in flocks, and hence offers no especial temptation to the gunner who, if he pursues it at all, must content himself with securing one tiny body at a shot; and although in fall our sandpiper becomes a perfect ball of fat, few consider the game worth the candle. Such being the case, we may expect to see this small wader survive many larger members of its tribe which, less fortunate than it, have a market value. The spotted sandpiper includes in its diet many insects that are harmful.

SANDERLING (Calidris leucophæa).

Range: Breeds from Melville Island, Ellesmere Land, and northern Greenland to Point Barrow, Alaska, northern Mackenzie, Iceland, and in northern Siberia; winters from central California, Texas, Virginia, and Bermuda to Patagonia.

The sanderling breeds on the far-away Arctic coast, and in early fall begins its wanderings southward. These take it pretty much over the known world. Even the Hawaiian Islands, in mid-ocean, more than 2,000 miles distant from the bird's nearest breeding grounds, are not too remote to attract it, though it is never numerous there. The sanderling is well named "beach bird," for sandy beaches are its favorite places of resort. No prettier sight can be imagined than a flock of these little white birds when busily engaged hunting for food. As the foam-topped breakers rush up the beach, and retreat to gather force for another dash, they plough up the sand, and expose for a few brief seconds multitudes of sand fleas and minute shell fish. These are the chosen food of the sanderlings, and to gather their harvest they keep pace with the progress of the waves, now advancing, now retreating, ever ready to snatch any hapless creature less nimble than they. Sanderlings fly in small companies, and often a few individuals mingle with flocks of larger species. Though naturally so tame and unsuspicious as hardly to recognize the presence of man, they associate in such small numbers that they are not greatly exposed to slaughter by the sportsman who, indeed, not long since, would have scorned such small game. But nowadays, when the larger shorebirds are scarce, the humble small fry must take their place and help fill the bag.

UPLAND PLOVER (Bartramia longicauda).

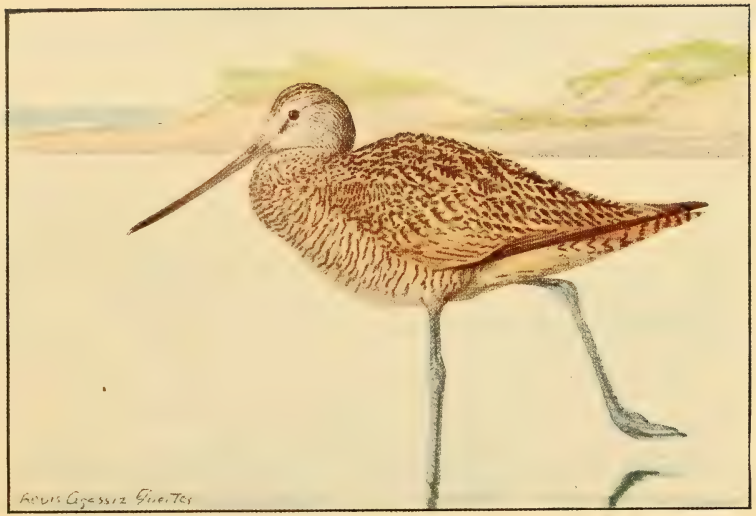
Range: Breeds from northwestern Alaska, southern Mackenzie, central Keewatin, central Wisconsin, southern Michigan, southern Ontario, and southern Maine to southern Oregon, northern Utah, central Oklahoma, southern Missouri, southern Indiana, and northern Virginia; winters on the pampas of South America to Argentina.

Though a member of the sandpiper family and in excellent standing, the upland plover has the habits and the melodious voice of both plover and curlew. It inhabits grassy prairies and pastures. Though sometimes found in companies of considerable size, the bird does not associate in compact flocks, as do many sandpipers, plovers, and curlews. Formerly it nested over much of the United States, though its center of abundance was always the Prairie States, where not many years ago it was found literally by thousands. By nature the upland plover is unsuspecting and, even after much persecution has taught it to be shy and wary of man, it may easily be approached on horseback or in a vehicle. Because of its approachability and its excellence for the table, the sportsman and the market gunner between them have practically exterminated the bird in much of its eastern territory, and it is no longer abundant anywhere. By the terms of the Federal law it is now unlawful to kill upland plover anywhere at any season, but it is to be feared that little attention is paid to the prohibition in the remote regions of the bird's habitat. The destruction of the species is the less excusable, as there are few of the family which are so valuable, whether viewed from the standpoint of the sportsman, the epicure, or the farmer. Every farmer should know that nearly half this plover's food consists of grasshoppers, crickets, weevils, and many other kinds of insects; while it behooves the cotton planter of Texas and other States to realize that among the insects the bird consumes is the cotton-boll weevil.

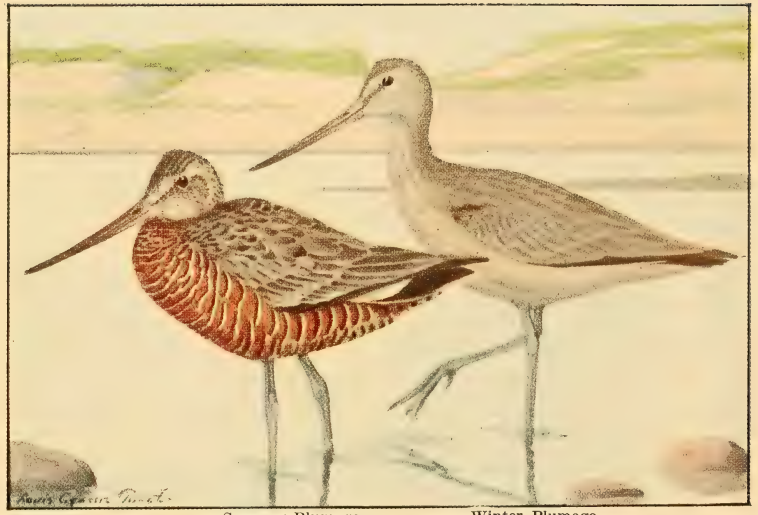
PECTORAL SANDPIPER (Pisobia maculata).

Range: Breeds on the Arctic coast from northern Alaska to mouth of Yukon and northeastern Mackenzie; winters in South America from Peru and Bolivia to northern Chile, Argentina, and central Patagonia.

The "grass bird," or "krieker," does not share the predilection of many of its relatives for the sea beach but prefers mud flats and marshes. In late fall the grass on the salt-water marshes is high enough to hide the krieker, and yet not offer resistance to its progress, and it is surprising how difficult it is to see one as it stands motionless watching the enemy with unalarmed eyes. This sandpiper arrives on the Bering Sea coast to breed in May, and Nelson's account of its song will surprise those who know the species only when migrating. Speaking of a night passed in the Yukon delta, he says: "As my eyelids began to droop and the scene to become indistinct, suddenly a low, hollow, booming note struck my ear. Again the sound arose nearer and more distinct, and with an effort I brought myself back to the reality of my position and, resting upon one elbow, listened. A few seconds passed and again arose the note; a moment later and, gun in hand, I stood outside the tent. The open flat extended away on all sides, with apparently not a living creature near. Once again the note was repeated close by, and a glance revealed its author. Standing in the thin grasses ten or fifteen yards from me, with its throat inflated until it was as large as the rest of the bird, was a male *A. maculata*. The note is deep, hollow, and resonant, but at the same time liquid and musical, and may be represented by a repetition of the syllables too-u, too-u, too-u, too-u, too-u, too-u, too-u."

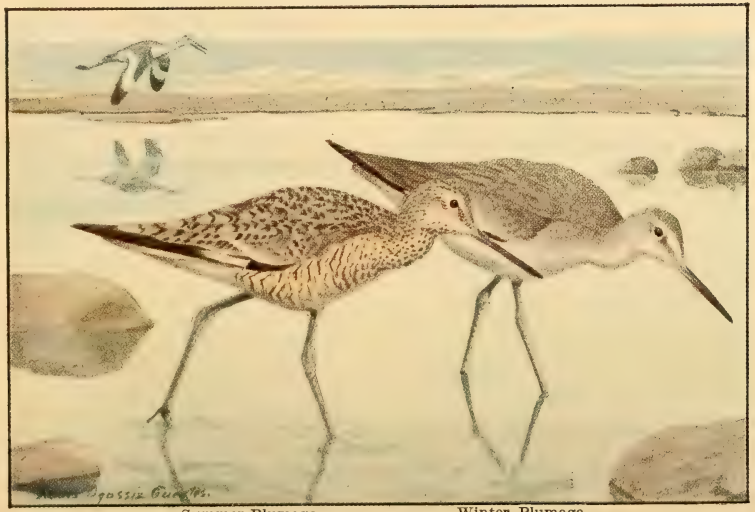


MARBLED GODWIT



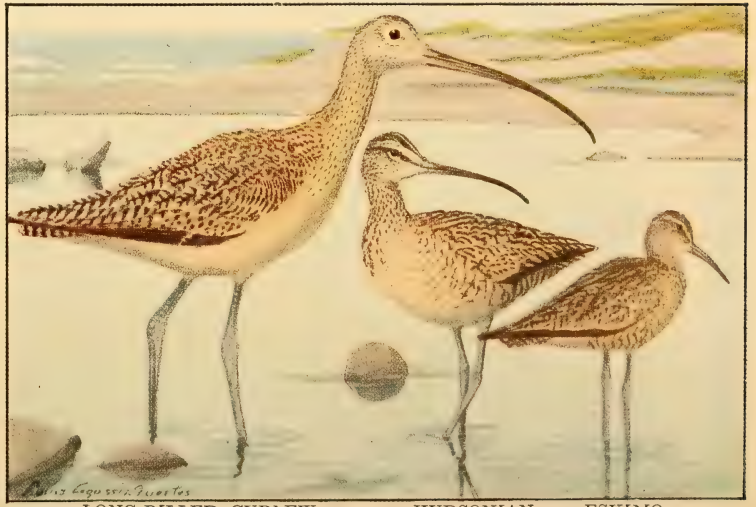
Summer Plumage Winter Plumage

HUDSONIAN GODWIT



Summer Plumage Winter Plumage

WILLET



LONG-BILLED CURLEW HUDSONIAN CURLEW ESKIMO CURLEW

MARBLED GODWIT (Limosa fedoa).

Range: Breeds from valley of Saskatchewan south to North Dakota; winters from southern Lower California, Louisiana, Florida, and Georgia to Guatemala and Belize.

The marbled godwit, one of the largest and finest of American shorebirds, formerly nested in Nebraska and Iowa. A few may still breed in North Dakota but the bulk of the species retire beyond our northern boundaries to rear their young. Though in summer an inhabitant of the interior prairies and marshes, the marbled godwit prefers to winter on the seacoast, and Cooke notes the remarkable fact that it "presents the unique spectacle of a bird breeding in the middle of the American continent and migrating directly east and west to the ocean coasts." While it is easy to prove that the marbled godwit formerly was much more abundant than it is now, it is doubtful if the bird ever existed in numbers comparable to certain other shorebirds, as the curlews and various sandpipers. Wherever it was found, the bird carried with it its own death warrant in its large size, excellent flesh, and its trusting disposition, which not only made it easy to decoy but prompted it to return once and again at the call of wounded comrades. Strict observance of the Federal regulation which prohibits the killing of this and certain other shorebirds until 1918, may possibly save the marbled godwit from extinction, but friends of our shorebirds may well watch with anxious foreboding the history of this bird during the next few years.

WILLET (Catoptrophorus semipalmatus semipalmatus).

Range: Breeds from Virginia (formerly from Nova Scotia) south to Florida and the Bahamas; winters from the Bahamas to Brazil and Peru.

The willet, including under this name both the eastern and the western forms, ranges widely over the United States and formerly bred in suitable localities over much of our territory. On the Atlantic it nested from Nova Scotia to the Gulf of Mexico, and probably small numbers yet nest on some of the sandy islands southward. At first thought it may seem strange that a bird so abundant and so widely distributed as the willet should have been so reduced in numbers, but the real wonder is that any remain after the treatment the species has been subjected to. The bird is wary enough and when alarmed informs the whole neighborhood by its loud outcries of the presence of danger. Yet as the result of being shot in season and out of season the species has at length been brought within measurable distance of the end. This statement applies more particularly to the eastern bird. The western form has escaped better, and in fall many of the western-bred birds visit the Atlantic coast. The process of exterminating our eastern willet was accelerated along the coast by the quite uniform practice of robbing the nests for the large and palatable eggs. Under the circumstances, no prophet was needed to foretell the inevitable end. To what extent the willet will be affected by the present Federal regulations remains to be seen. The essential facts regarding the willet and the fate that awaits it are known to many sportsmen, but it is to be feared that the destruction of this and other species may be hastened by the feeling among them that if the residents of one particular State or locality do not get the few remaining shorebirds others will.

HUDSONIAN GODWIT (Limosa hæmastica).

Range: Breeds from the lower Anderson River southeast to central Keewatin; winters in Argentina, Patagonia, and the Falkland Islands.

Nothing less than two continents suffice to satisfy the roving disposition of the Hudsonian godwit which, according to Cooke, probably breeds on the barren ground from the mouth of the Mackenzie to Hudson Bay. The species winters in Argentina and Chile and after leaving our northeast coast probably reaches winter quarters by an all-sea route. On the return journey in spring the godwit reaches Texas in April, and follows up the Mississippi Valley, thus, in a general way, duplicating the route of the golden plover. The Hudsonian godwit has been greatly aided in its struggle with fate in the shape of merciless sportsmen by the fact that its breeding grounds are in a distant and desolate region where its parental duties are little interfered with. Though to-day more numerous than the marbled godwit, its destiny is equally sure and almost as imminent. Nothing short of absolute protection for a term of years will save the species from extinction. Under the Federal regulations, the Hudsonian godwit, like some of its relatives, is given a close season till 1918. Such regulations are easy to enact but are difficult of enforcement, especially in remote districts, and unless the cordial cooperation of the devotees of the shotgun can be secured, the fate of this species, and some others as well, is only too certain.

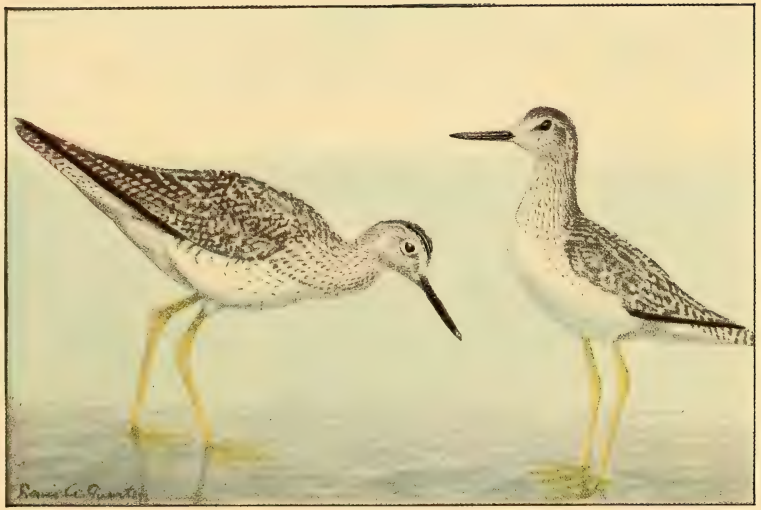
LONG-BILLED CURLEW (Numenius americanus).

Range: Breeds from central British Columbia, southern Saskatchewan, and Manitoba to northeastern California, northern New Mexico, and northwestern Texas; winters from central California and southern Arizona south to Guatemala, and on Atlantic coast from South Carolina to Florida, Louisiana, and Texas.

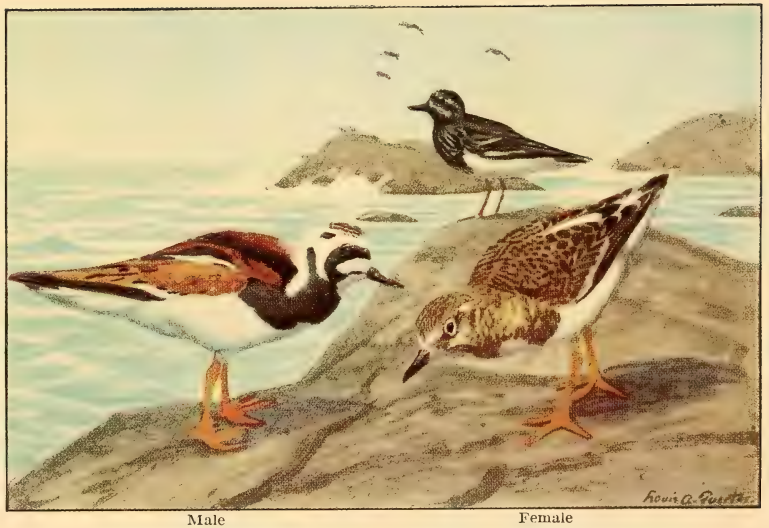
Few in our times have known this big curlew in the Atlantic States, although a century or less ago flocks of considerable size were not uncommon. Many of us, however, have made the acquaintance of the bird in the Western States, where it breeds or did breed, from Canada to Texas. Those best acquainted with the recent status of the bird see little hope for it. The natural extension of agriculture has greatly limited its breeding grounds, and for this there is no remedy. Nor should one be desired, since in the mind of every right thinking citizen farms are more important than breeding grounds for curlew. Nevertheless, the curlew is not an over-shy bird, and, if accorded reasonable treatment, and left undisturbed during the breeding season, would long survive in its old haunts. Protected till 1918 under the Federal law, it needs in addition only the protection of public sentiment to live on indefinitely. Its flesh is rather tough and dry, even on the prairies where it feeds much upon insects and berries, while in its seaside resorts, where it subsists on marine life, its meat is too strong to be palatable. As the bird eats many insects and crawfish, we may plead its utility as an additional argument in its favor, and beg sportsmen and others who may be said to hold the life of the species in their hands to abstain from killing curlews. Continued shooting means speedy extinction.

HUDSONIAN CURLEW (Numenius hudsonicus) (See page 148).

ESKIMO CURLEW (Numenius borealis) (See page 148).

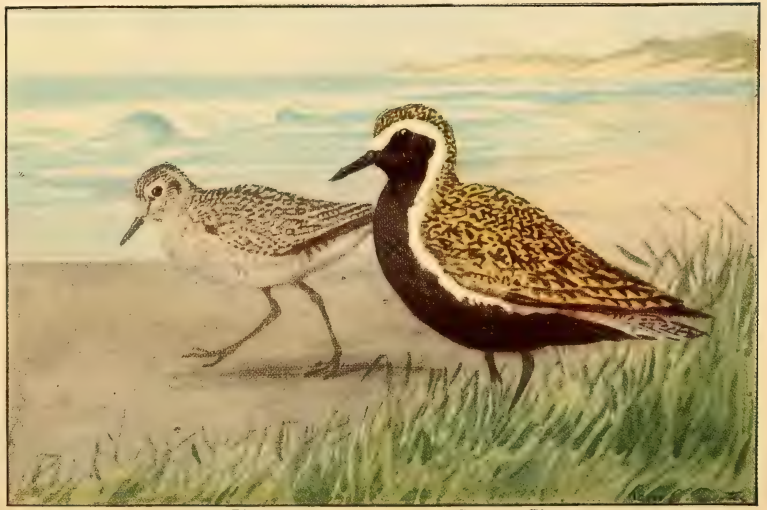


GREATER YELLOW LEGS LESSER YELLOW LEGS



Male Female
RUDDY TURNSTONE BLACK TURNSTONE (Top)

Winter Plumage Spring Plumage
BLACK-BELLIED PLOVER



Winter Plumage Summer Plumage
GOLDEN PLOVER

GREATER YELLOW-LEGS (Totanus melanoleucus).

Range: Breeds from Lake Iliamna, Alaska, and southern Mackenzie to southern British Columbia, Ungava, Labrador, and Anticosti Island; winters from southern California, Texas, Louisiana, and Georgia south to Patagonia.

The yellow-legs is one of the largest and most conspicuous of our shorebirds, and though greatly reduced in numbers, is still comparatively abundant. Like many other shorebirds, its numbers vary locally and with different years, such fluctuations being chiefly due no doubt to favorable and unfavorable breeding seasons in the far North. On the eastern coast the yellow-legs has learned that flight over the sea to its winter quarters in South America is safer than an all-land route where expectant gunners beset the shores, and this practical knowledge has greatly aided in conserving the species. The bird has a loud and mellow call note which is easily imitated and is often employed in connection with wooden decoys to lure a flock within range of the deadly shotgun. Experience, however, soon teaches the yellow-legs to be shy and suspicious, and its long neck and still longer legs eminently fit it for the post of watchman in a flock of shorebirds. For our big wader has a most friendly disposition, and associates on the closest terms with other members of the long-legged fraternity, both large and small. Hence among them its loud call has come to be recognized as a warning of danger.

LESSER YELLOW-LEGS (Totanus flavipes) (See page 148).

BLACK-BELLIED PLOVER (Squatarola squatarola).

Range: Breeds on the Arctic coast from Point Barrow to Boothia and Melville Peninsulas; also on the Arctic coast of Russia and Siberia; winters from California, Louisiana, and North Carolina to Brazil and Peru.

The "beetle-head" bears a rather close superficial resemblance to the golden plover, with which it sometimes associates, but the sportsman with quarry in hand can instantly distinguish them by a glance at the toes. If there are three toes in front and one behind, his bird is the beetle-head. The golden plover has only three toes. Like the golden plover the beetle-head breeds in Arctic lands, but unlike that bird it uses practically the same fly lines summer and fall. It inhabits both the Atlantic and Pacific coasts and also a wide strip of the interior, including the Mississippi Valley. The black-belly was formerly very abundant over most of its range, but has suffered a marked decrease in the past fifty years. It is possible that the abolition of spring shooting in a few of the Atlantic States has had an effect in retarding its decrease. It is to be hoped that this is true and that, as all shooting of this species is prohibited until 1918, the beetle-head will make substantial gains. If sportsmen and others interested can be convinced that protective measures are effective, and that under them some of our more important game birds are materially increasing, it may be possible to secure their cooperation in a really effective enforcement of protective regulations, not only in favor of the present species, but of shorebirds generally.

RUDDY TURNSTONE (Arenaria interpres morinella).

Range: Breeds on Arctic shores from Mackenzie River east, probably to Melville Peninsula, and north to Melville Island; winters from central California, Texas, Louisiana, and South Carolina to southern Brazil and central Chile.

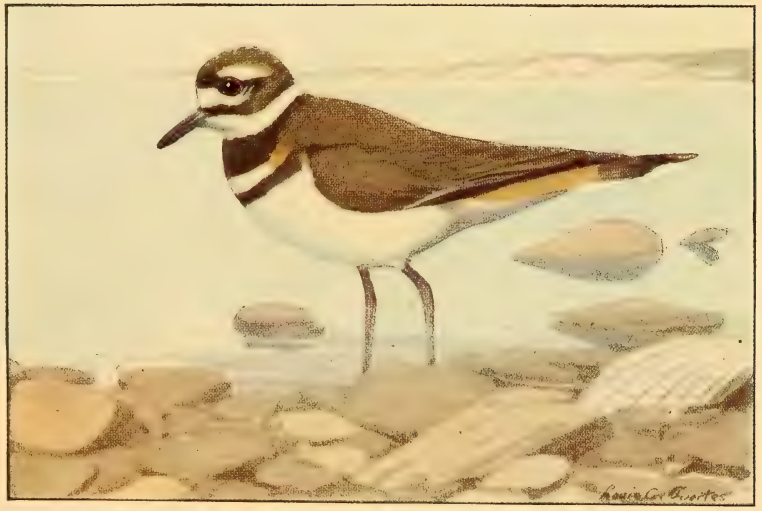
The curious little turnstone or "calico-back" differs in many respects from other shorebirds. It has a short stout bill, short stocky legs, and a vigorous compact body, and this unusual combination enables it to perform stunts unknown to shorebirds generally. Thus it obtains no inconsiderable part of its food by prying over stones, shells, or sods with its bill, for the purpose of securing the small insect life that lurks underneath. Forbush states that formerly the turnstone was of much economic importance along the New England coast, where it was known to gunners as "chicken plover," and was shot in great numbers. This turnstone is notable as being one of the first shorebirds to figure in protective measures, being protected at night under a Massachusetts law passed in 1835, together with the plover, curlew, and doughbird. Though enjoying legal protection, as the phrase goes, the bird was little protected in fact, as results show. It is true that the species has lasted till now, but it has because comparatively uncommon. Its existence to-day is due less to the protection it received in the past than to the inaccessibility of its breeding grounds in the far North. In the southern islands, where it winters, it sometimes plays a remarkable role. Who would imagine that one of our small shorebirds could be made to do duty as a game cock! But Dr. Finsch states (Ibis, 1881) that the natives keep turnstones in cages for pets, and match them against each other, as game cocks are elsewhere matched.

BLACK TURNSTONE (Arenaria melanocephala) (See page 148).

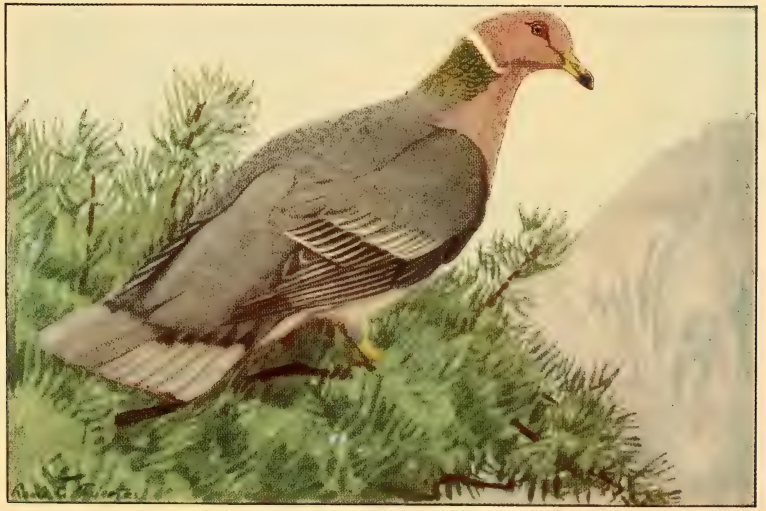
GOLDEN PLOVER (Charadrius dominicus dominicus).

Range: Breeds from Kotzebue Sound along the Arctic coast to mouth of Mackenzie, and from Melville Island, Wellington Channel, and Melville Peninsula south to northwestern Hudson Bay; winters on the pampas of Brazil and Argentina.

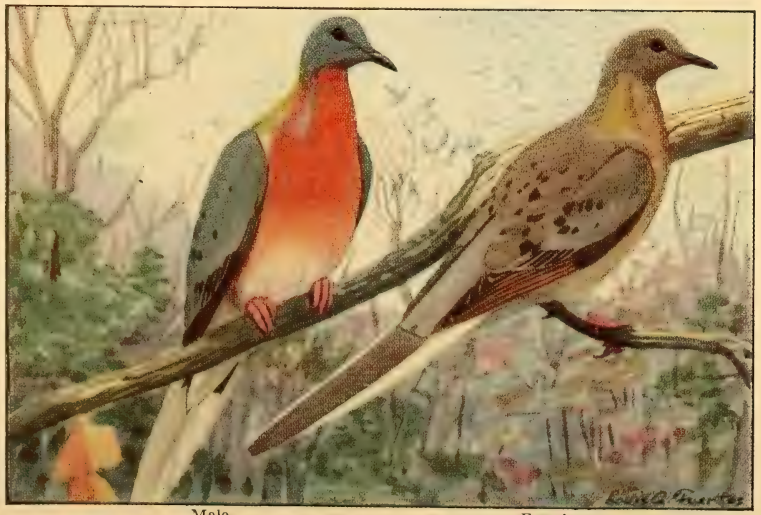
At one season or another the golden plover occurs over practically all of the United States and formerly its numbers were enormous. The migrations of this plover are unique among shorebirds. Under ordinary circumstances, the route the bird follows to its Argentine wintering grounds protects it completely, since when it leaves Labrador it boldly strikes across the ocean and, unless deflected by storms, apparently does not fold its wings until it reaches the South American Continent. So long a flight without resting may seem impossible for a bird as small as this plover. We know, however, that a close relative, the Pacific golden plover, flies from Alaska to the Hawaiian Archipelago, a distance of quite 2,000 miles. While the Atlantic species might stop to rest if it would, the Pacific coast species has no stopping place between its starting point and its destination. Probably, as Cooke surmises, from food consideration the Atlantic coast species returns in spring by an all land route, and passes up the Mississippi Valley in great numbers. Though protected in fall from sportsmen by the route it follows, spring shooting in the Mississippi Valley has depleted the ranks of this plover to a pitiful remnant of its former numbers. The time has indeed long passed when a party of sportsmen, however large, can kill forty-eight thousand plover in a day, as Audubon states was done near New Orleans in 1821, and now the question to be solved is whether protection during its spring migration comes too late to save the species.



KILLDEER

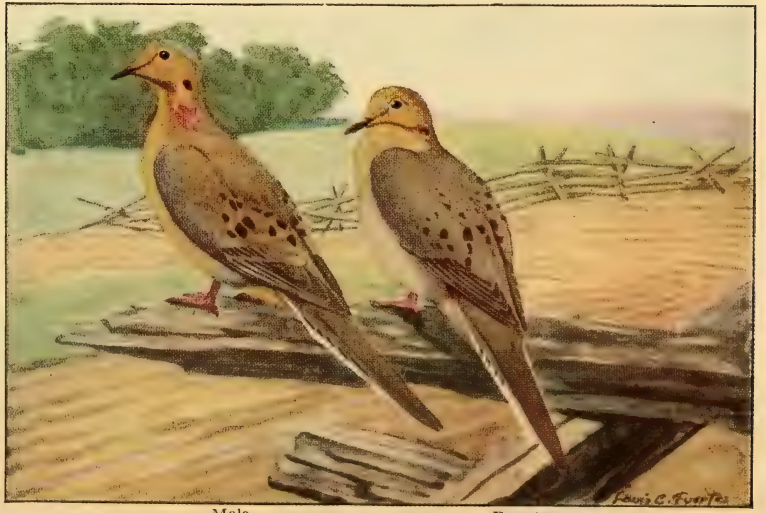


BAND-TAILED PIGEON



Male Female

PASSENGER PIGEON



Male Female

MOURNING DOVE

KILLDEER (Oxyechus vociferus).

Range: Breeds from central British Columbia, southern Mackenzie, central Keewatin, and central Quebec south to Gulf coast and central Mexico; winters from California, Arizona, Texas, Indiana, New Jersey, and Bermuda south to Venezuela and Peru.

The killdeer is unquestionably one of the most widely distributed and one of the best known of the plover tribe. The bird student who makes its acquaintance need not ask its name, for the bird never tires of repeating it at all seasons. Its vociferous iteration of "kill-deer, kill-deer" brings down on its offending head the wrath of the sportsman whose cherished plans for a successful stalk of a flock of ducks are upset by its excited cries, rightly interpreted by the ducks as signals of danger not to be neglected.

Though the killdeer is a plover, he cares very little for the seacoast, nor overmuch for the neighborhood of water, but finds all his wants supplied in upland pastures and plowed lands. His bill of fare is a long and varied one, and includes many pestiferous kinds of insects. As the bird's flesh is little esteemed and its services are of decided value to man, no very good reason appears why the species should not flourish. But though the bird is still numerous, it has been exterminated in many localities. As it is now protected under the Federal law we may look to see it again occupy territory from which it has been long absent. There is the more reason to expect this since the killdeer responds quickly enough to decent treatment, as is evidenced by the fact that a pair has nested for three successive seasons on a golf course near Washington, D. C. Despite the fact that the location of the nest was known to at least a hundred players and caddies, and that the piece of "rough" in which the nest was located was invaded scores of times daily, the birds were successful in bringing out their young each year, though plovers never had a more exciting time doing it.

PASSENGER PIGEON (Ectopistes migratorius).

Range: Bred formerly from middle western Mackenzie, central Keewatin, central Quebec, and Nova Scotia south to Kansas, Mississippi, Pennsylvania, and New York; wintered principally from Arkansas and North Carolina south to central Texas, Louisiana, and Florida.

On September 1, 1914, aged twenty years, departed this life the sole surviving passenger pigeon. This brief obituary records the disappearance from earth not only of the last survivor of a notable American game bird, but, what is infinitely sadder, the passing of a species. The history of the passenger pigeon from the first settlement to and including our own times reads like a romance, but a romance tinged on every page with man's cruelty, rapacity, and shortsightedness. Early accounts of the enormous numbers of this pigeon that migrated from section to section read like fables, but they are too well attested to be doubted. Wood's account of the passenger pigeon (1629-34) is so quaint I subjoin part of it:

"These Birds come into the Countrey, to goe to the North parts in the beginning of our Spring, at which time (if I may be counted worthy to be believed in a thing that is not so strange as true) I have seene them fly as if the Ayerie regiment had beene Pigeons; seeing neyther beginning nor ending, length or breadth of these Millions of Millions."

Audubon states that he rode through a winter roosting-place in Kentucky which was more than forty miles long and three miles wide. It may be doubted if in the prime days of this pigeon its numbers were ever equalled by any bird, either in the Old World or the New. Only its great numbers enabled it to survive the assaults of its enemies as long as it did. Then came the market netter, and everywhere the hapless pigeons were taken in season and out of season, with eggs in their bodies ready for the nest and with nests full of young. While neither the netter nor the sportsman is responsible for the extermination of the last passenger pigeon, it is nevertheless true that by the combined assaults of the two, the species was reduced to such a low ebb that it could not recover. Protective legislation was too late.

BAND-TAILED PIGEON (Columba fasciata fasciata).

Range: Breeds from southwestern British Columbia, western Washington, western Oregon, northern Utah, and north-central Colorado south through southwestern United States and Mexico to Nicaragua, and east to western Texas; winters from southwestern United States southward.

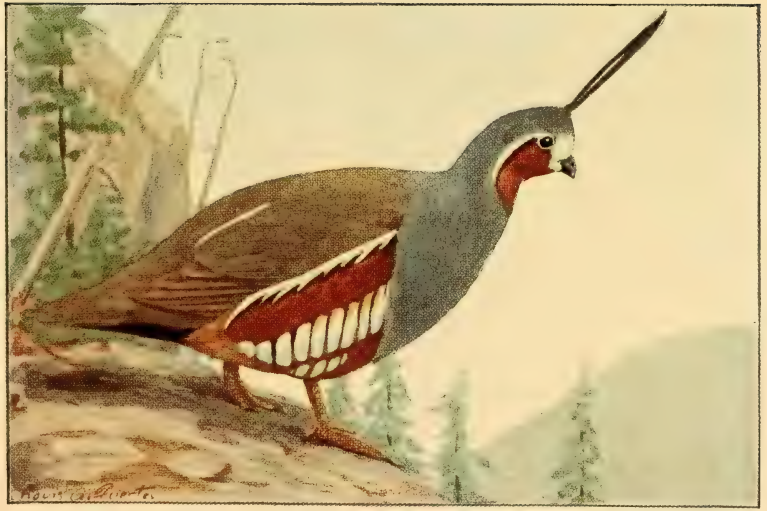
Though bearing no very close resemblance to the passenger pigeon, the band-tail may be said to represent that bird on the Pacific coast. Like the pigeons generally, the band-tails are sociable, and flocks of hundreds used to be common in the oak groves of southern California.

They are extremely fond of acorns, and although of late years persecution has made them wary they will risk much to obtain their favorite food. When they find a well-laden oak tree they will swallow acorns till they are full to the very bill. As their soft bills are totally inadequate to hull the acorn, they swallow shells and all, and such are their powers of digestion that they can dispose of at least two full meals every day. They are said to breed in Arizona nearly every month of the year, and Vernon Bailey found them nesting in the Guadalupe Mountains, Texas, as late as August. Their note in the breeding season is a hoot singularly like an owl's, but most of the year they are silent. On the west coast for years they have been persistently hunted, and as they breed in the mountains, which are much resorted to by summer campers, the limits of the close season are by no means always observed. It is high time to take active measures for the preservation of the band-tail; otherwise it will soon meet the same fate as the passenger pigeon.

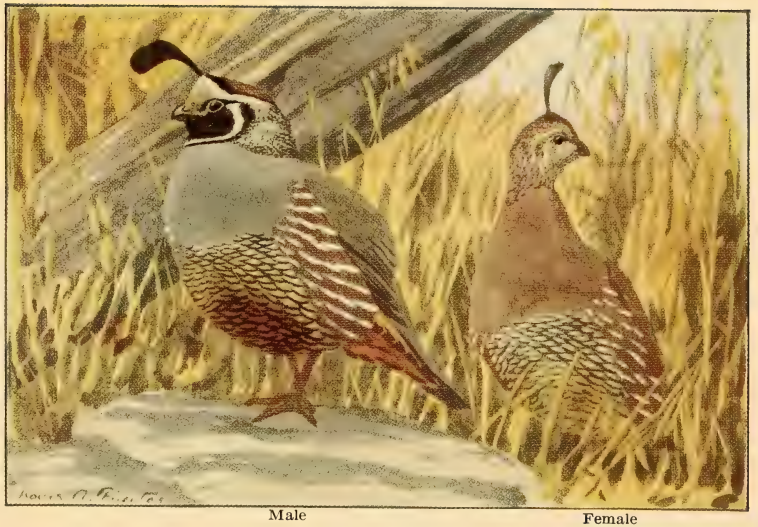
MOURNING DOVE (Zenaidura macroura carolinensis).

Range: Breeds from British Columbia, Saskatchewan, Manitoba, Ontario, and southern Nova Scotia south throughout the United States and Mexico, and locally in Lower California and Guatemala; winters from southern Oregon, southern Colorado, the Ohio Valley, and North Carolina to Panama.

The mourning dove is in no present danger of extinction. Several traits contribute to its safety. Although sociable enough, it never assembles in vast flocks which act as a unit, but the pairs nest more or less apart and only in fall and winter assemble in large numbers in their favorite feeding places. Hence, netting the bird on a large scale is impossible. Then, too, though the mourning dove never lays more than two eggs and sometimes only one, it is very prolific, since it often nests twice, and sometimes three times in a year. Its prowess of wing renders it indifferent to miles, and we used to see mourning doves in the western deserts, miles away from their nesting places, traversing with swift pinions the desert spaces toward some distant watering hole which they alone knew of. The thirsty prospector, when he observes numbers of doves hurriedly pursuing the same line of flight in the hotter hours of the day, shapes his course accordingly and usually finds water.

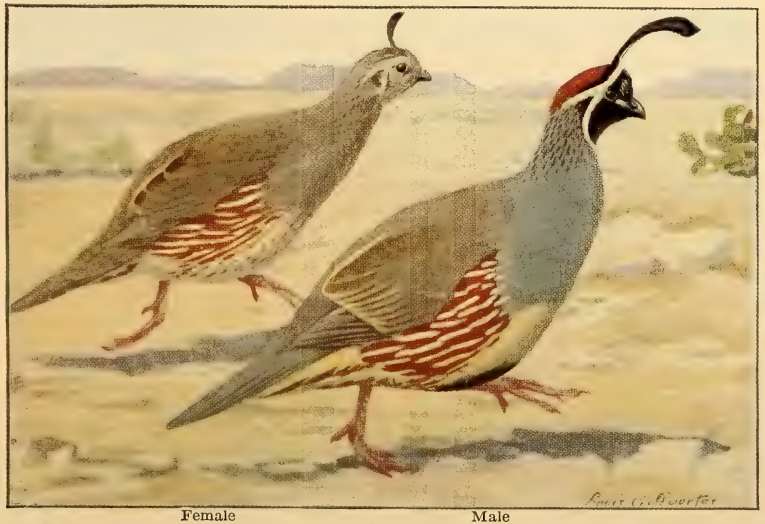


MOUNTAIN QUAIL



Male Female

VALLEY QUAIL



Female Male

GAMBEL'S QUAIL

SCALED QUAIL CHESTNUT-BELLIED SCALED QUAIL

MOUNTAIN QUAIL (Oreortyx picta picta).

Range: Pacific coast from southwestern Washington south to Monterey County, California.

All our American quail are beautiful, but this superb denizen of the mountain sides bears away the palm. Its elegant form, rich coloration, its long, nodding black plumes, its brown gorget, and its alert carriage lend the bird an air of rare distinction. Our plumed knight of the mountains loves not the low country with its dry watercourses, its heat and dust, but chooses for his permanent home the mountain valleys and hillsides with their pure air and numerous streams. This quail, with its two varieties, is strictly limited to the west coast where it ranges from Lower California into Washington. Formerly it was abundant over most of its range, and it is yet numerous in many localities. In Oregon it used to be trapped in great numbers, and as long ago as 1880 was commonly exposed in the city markets in crates containing twenty or more. Even the market men decried the practice, but nevertheless cheerfully sold the birds at three dollars per dozen. A sad sight it was to see these beautiful creatures captive and exposed for sale. My own experience with the mountain quail dates back many years. All the covies I saw in California and Oregon were comparatively small, always less than ten, and the bird appears rarely, if ever, to associate in great gatherings composed of several or more independent covies, as does the valley and Gambel's quail. When in their ordinary mountain haunts, plumed quail are tame enough, altogether too tame for their own safety, but I am told that where much pursued by sportsmen with or without dogs, they rapidly lose their unsophisticated ways and learn to take good care of themselves.

GAMBEL'S QUAIL (Lophortyx gambeli).

Range: Desert region of southern California, southern Nevada, Arizona, and southwestern Utah, east to the southwestern corner of Colorado; also in southwestern New Mexico to the Rio Grande Valley and the El Paso region of extreme western Texas, and south into the northeastern corner of Lower California and to Guaymas, Sonora.

Though differing markedly in coloration from the valley quail of the Pacific coast, Gambel's quail so closely resembles that bird in size and general habits that in my mind the two are inseparable. That the quail themselves are sometimes misled by the likeness would appear from the fact that the two readily hybridize, and I have seen a number of the hybrids from southeastern California. This quail prefers cañon bottoms and rocky hillsides for hunting grounds, and the speed with which the individuals of a frightened covey can make good their escape among rocks and bushes is surprising. Gambel's quail trusts for safety first to its legs and only secondarily to its wings, while it is rare indeed that it resorts to Bob-white's favorite ruse of close hiding. Ordinarily in fall it associates in large bands —they can scarcely be called covies, since they are the aggregate of many covies— and under these circumstances the pot hunter who cannot slay his scores must indeed be a bungler. Gambel's quail is no stranger in vineyard and garden, although for the most part it frequents scantily inhabited districts. In one respect both Gambel's and the California valley quail have greatly the advantage over Bob-white since, if these two western species ever roosted on the ground, they long ago abandoned the habit in favor of trees and thick undergrowth, where they are safe from most prowlers of the darkness.

VALLEY QUAIL (Lophortyx californica californica).

Range: Pacific coast region from southwestern Oregon south to Monterey County, California; introduced into Vancouver Island, Washington, and Colorado.

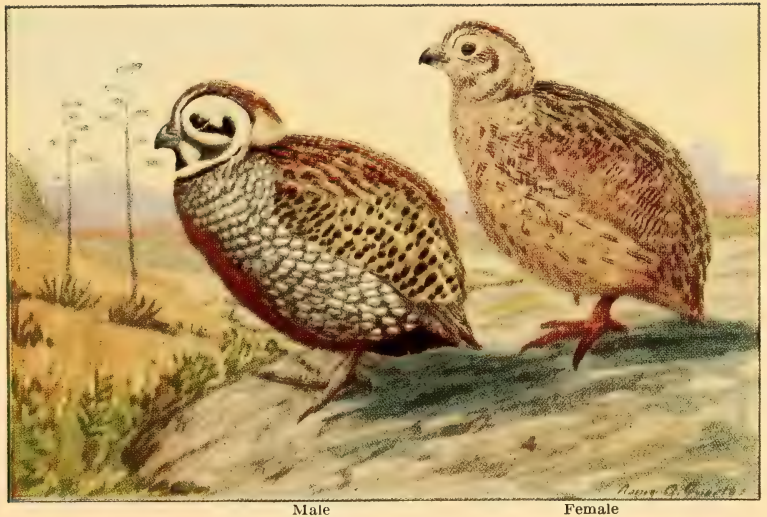
The two forms of quail inhabiting the coast and valley regions of Oregon and California, though differing enough in plumage to constitute races, are very similar in habits. As its name implies, the bird prefers valleys to mountains, although it may range upward as high as four thousand feet, at about which point it meets the habitat of its larger relative, the mountain quail. The valley quail is widely distributed, and being very prolific, it is, or was, exceedingly abundant over most of its range. Eastern sportsmen, knowing only our Bob-white, would find it difficult to credit tales that might be told of the numbers of valley quail that formerly congregated in favorable localities. Flocks of over two hundred were common enough, but in the late seventies and eighties I have occasionally seen several thousand assembled together near water. When flushed, successive bands of hundreds rose simultaneously with an extraordinary whir of wings, and the air was filled with their flying forms. Such sights are of the past, although the valley quail is still numerous in many regions. It is on good terms with civilization and is prone to frequent cultivated tracts, especially vineyards and gardens, even on the outskirts of populous towns. Its fondness for grapes does not endear it to the vine grower, and he often has to resort to extreme measures to protect the bunches of ripe fruit which probably furnish the quail not with food but with water, for this quail discovered the virtues of grape juice long before it was put on the market.

SCALED QUAIL (Callipepla squamata squamata).

Range: From central Arizona to western Texas, north to southern Colorado and over most of the Panhandle of Texas, east nearly to central Texas, and south to the Valley of Mexico.

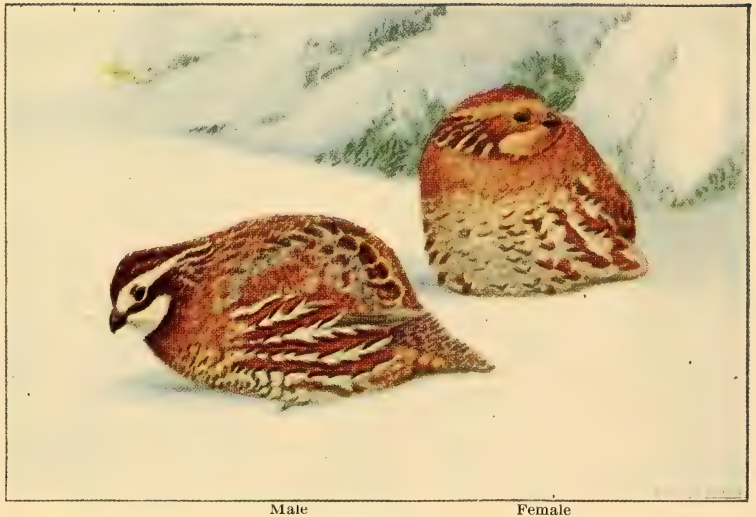
The cottontop, as the scaled quail has been dubbed from its conspicuous whitish crest, has a restricted range in the United States along our southern border. The country it frequents is dry and barren, and chaparral and mesquite form its favorite cover. On account of the dry nature of quails' food they are greatly dependent upon water, and hence the presence of large numbers of cottontops may be taken as a pretty sure indication that a stream or waterhole is not far away. Western quail of whatever species have learned to trust to their legs rather than their wings to carry them out of harm's way, and the cottontop forms no exception to the rule. When alarmed, a bevy will scatter hither and yon among the rocks or brush, to come together again when the supposed danger is past. When hard pressed it is an adept at close hiding. The bluish gray plumage of the cottontop harmonizes well with its usual surroundings and no doubt the confidence the bird reposes in its protective coloration is justified by long experience. Protected by the remoteness of its desert home this quail should long survive the fate of some of its less fortunate relatives, though the automobile, with its power to annihilate distance, is a new danger which it has yet to meet.

The habits of the chestnut-bellied scaled quail are so similar to those of the present species as not to call for separate mention. The bird ranges from the lower Rio Grande Valley in Texas to Coahuila and Nuevo Leon, Mexico.



Male Female

MEARN'S QUAIL

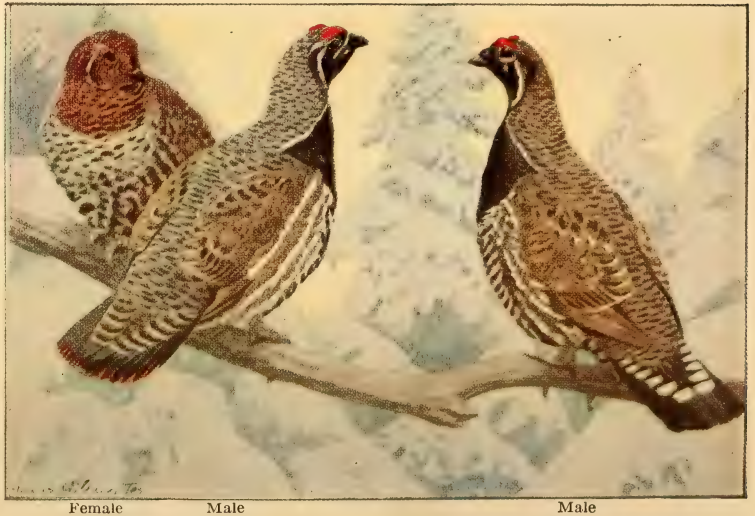


Male Female

BOB-WHITE

Male

RUFFED GROUSE



Female Male Male

SPRUCE GROUSE FRANKLIN'S GROUSE

MEARN'S QUAIL (Cyrtonyx montezumæ mearnsi).

Range: From central Arizona and central New Mexico east to central Texas, and south to the mountains of northern Coahuila, Chihuahua, and eastern Sonora.

Mearn's quail is a Mexican species which crossed our borders long before there were political boundaries, and established itself in the low mountain ranges of our western border States, where in time it changed somewhat from the parent stock. Although I have spent considerable time in the country it inhabits, chiefly in eastern Arizona, I never found it numerous, and though I searched persistently only occasionally discovered a small covey. If I am to judge by my rather limited experience, Mearn's quail is the tamest of its kind, and well deserves the epithet of "fool quail" locally bestowed on it. So closely does the bird lie after being once started that I found it almost impossible to flush one a second time unless I marked it down to the foot. I have observed one sitting motionless on a log by the side of the trail, within riding-whip distance of a passing mule train, apparently so petrified with astonishment as to be incapable of motion.

RUFFED GROUSE (Bonasa umbellus umbellus).

Range: Eastern United States from Minnesota, Michigan, southern New York, and southern Vermont south to eastern Kansas, northern Arkansas, Tennessee, and Virginia, and in the Alleghenies to northern Georgia.

This, the partridge of the northern woods, the pheasant of the South, may well be termed the prince of American game birds. Its high position, however, is likely soon to be vacant and its place taken by some lesser member of the game-bird galaxy unless vigorous efforts are made to check its decrease. Possessed of a vigorous constitution which enables the bird to brave the northern winter and defy all ordinary vicissitudes of weather, vigilant and shy where much persecuted, strong of wing and skilled in many a wile by means of which to elude the sportsman and his keen-scented dog, our partridge is well equipped to make a brave fight for existence. And how bravely has it faced its fate! Though usually a resident of extensive forested tracts it is amazing how long the ruffed grouse will continue to live in leafy swamps of a few acres, or on little wooded islands, mere relics of its former forested domain. Gun and dog, natural diseases, sleety storms, and unfavorable breeding seasons are most potent for harm, while the high price placed on its flesh in the market is having its natural effect. In much of its range little time remains in which to save it. It is non-migratory, and hence only the States in which it lives can avert its impending doom. That the bird can be propagated in confinement is much in its favor, and a little of the money spent in attempts to introduce foreign game birds would go a long way toward rehabilitating the partridge. No sound that echoes through our woods has quite the effect on the wayside stroller as the martial summons of the ruffed grouse, and it will be thrice a pity if future generations must miss the spring and fall roll call of this woodland drummer.

BOB-WHITE (Colinus virginianus virginianus).

Range: Eastern North America from South Dakota, southern Minnesota, southern Ontario, and southwestern Maine south to eastern and northern Texas, the Gulf coast, and northern Florida; west to eastern Colorado.

Whatever this little friend of ours says to us in spring, whether "bob-white," as many interpret it, or "more-more-wet," according to the practical farmer, he utters it in such vigorous, albeit mellow tones, that he thereby endears himself to all hearts. And how many there are who, as the promises of spring are fulfilled by opening summer, listen for the cheerful message of this blithe whistler of fence post and thicket and are made happier when they hear it. And "Bobby" is no recluse of the thick woods. He loves the brier patch, the brown stubble, and the open, weedy field. The bright sunlight shines for him, and his loud, cheery call is sounded from some vantage point in the open as though he would have all the world hear his challenge to produce anything more beautiful than his little brown mate snugly hidden away near by. Long may his cheery whistle sound through the land. There is no reason why it should not, save the too ardent zeal of the sportsman and the greed of the epicure. Bob-white is prolific, knows pretty well how to take care of himself, and, if need be, can be reared in captivity. The fate of Bob-white, as of some other non-migratory game birds, rests solely with the several States within which he dwells. Unquestionably, in most States, the present bag limit is altogether too high and should be materially reduced. The farmer, too, should have a word to say in the premises since the food of Bob-white is such that he cannot afford to permit unlimited quail-shooting over his farm, but should jealously guard his covies and be sure that enough pairs are left to insure the future of the species.

SPRUCE GROUSE (Canachites canadensis canace).

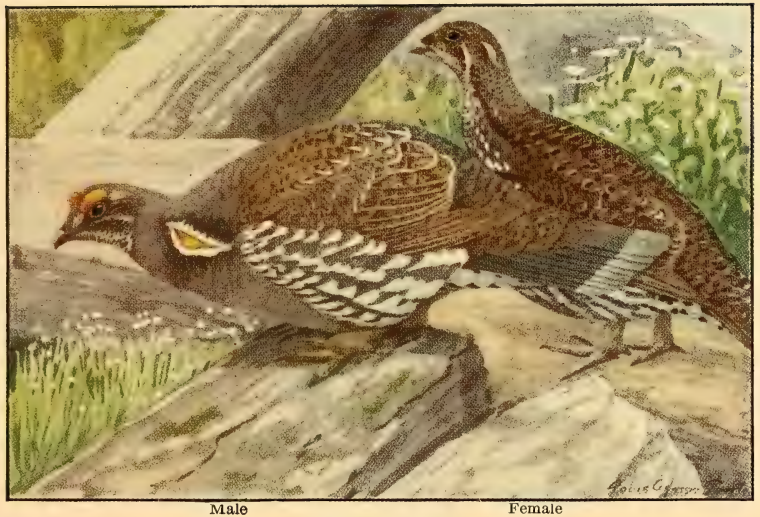
Range: Manitoba, southern Ontario, and New Brunswick south to northern parts of Minnesota, Wisconsin, Michigan, New York, and New England.

The history of the spruce partridge must be written mostly in the past tense, so far at least as the United States is concerned. It used to be common in Michigan, the Adirondack region of New York, and in northern New England, but in all three districts is now either rare or altogether wanting. The unsuspicious nature of this grouse and its total obliviousness to danger from human beings, or rather inhuman beings, probably had more to do with its sad end than anything else. It is said that when a flock was surprised in trees, one after another could be shot down till the last one was gone. As the grouse is practically non-migratory, its preservation depends solely on the States in which it lives, and upon them must rest the responsibility for its fate.

FRANKLIN'S GROUSE (Canachites franklini).

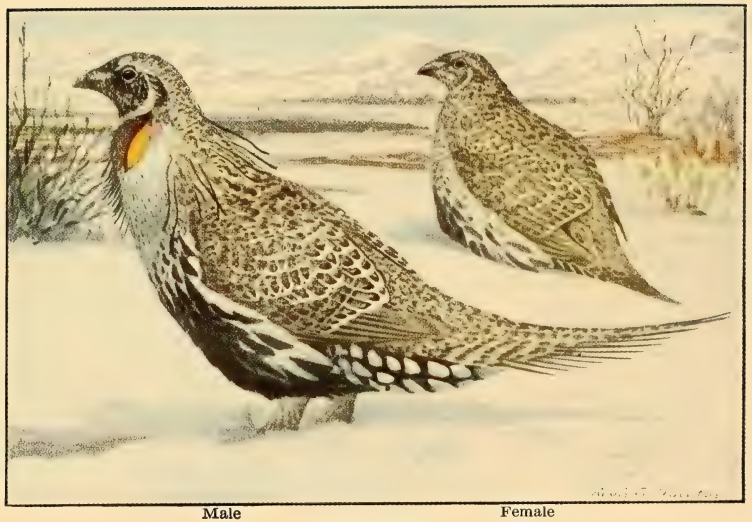
Range: Southern Alaska, central British Columbia, and west-central Alberta south to northern Oregon, central Idaho, and western Montana.

Franklin's grouse was first described by Lewis and Clarke who saw it in Idaho while on their memorable trip to the Pacific coast. While thus known for more than a century, surprisingly little has been recorded concerning its mode of life. From the close similarity it bears to the spruce partridge of the East, it no doubt possesses very similar habits. At least it has the same confiding disposition as that bird, as is attested by the fact that its habit of standing in amazed curiosity to watch the movements of an approaching foe intent on its destruction has earned it the contemptuous epithet of "fool hen." Like our ruffed grouse, this bird is a drummer, but instead of sounding the roll from rock or log, the male drums, according to Dawson, by rapidly beating the air with his wings as he slowly sinks from some elevated station or mounts upwards to it.



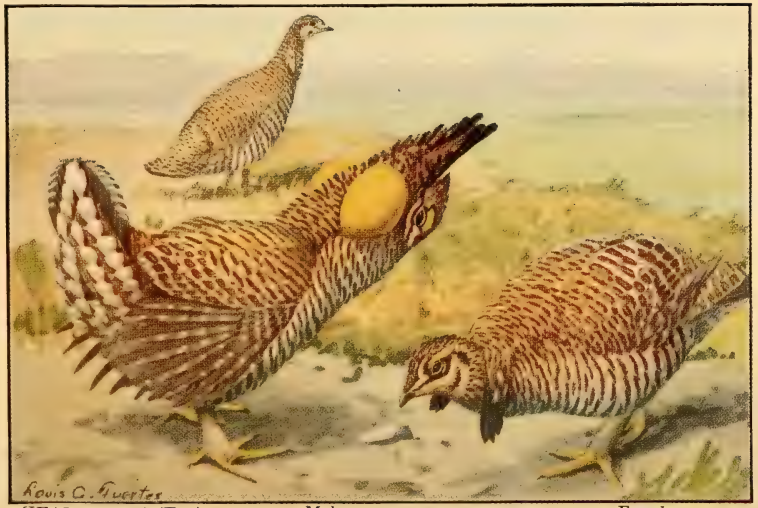
Male Female

DUSKY GROUSE



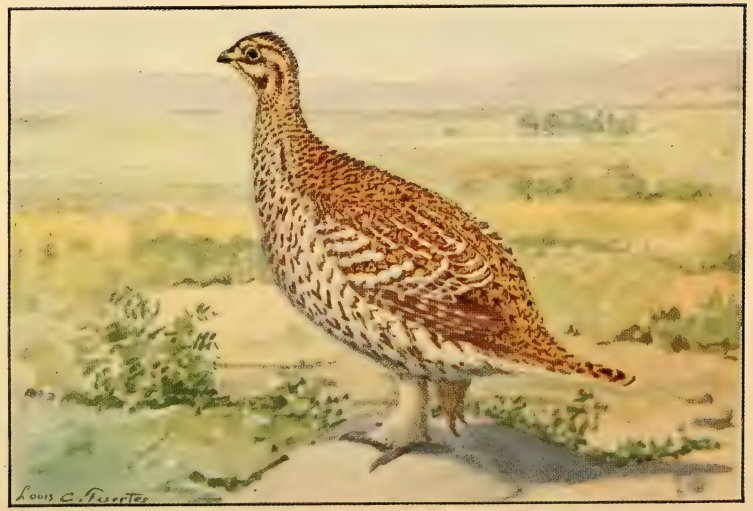
Male Female

SAGE HEN



HEATH HEN (Top) Male Female

PRAIRIE CHICKEN



SHARP-TAILED GROUSE

DUSKY GROUSE (Dendragapus obscurus obscurus).

Range: Rocky Mountains from northern Utah and northern Colorado to central western New Mexico and central Arizona, and west to East Humboldt Mountains, Nevada.

This large and beautiful grouse affords an excellent illustration of the effect of the gun on the disposition and habits of a game bird. An inhabitant of the mountains and too small to be much hunted by the Indians when larger game was so abundant, this grouse in early days exhibited the extreme of tameness and indifference. I have many times seen parties of from six to a dozen that scarcely took the trouble to move out of the trail, so entirely unconscious of danger were they and so curious as to the errand of the intruder. Under such circumstances, when alarmed by a gun the flock is apt to betake itself to the nearest trees and sit motionless on the branches, evidently believing themselves to be invisible. The term "fool hen," by which they are known, rather aptly describes their conduct and demeanor on such occasions. Even the "fool hen," however, can profit by experience, and the lesson of caution once learned, it is as shy as it previously was tame. Its flesh is delicious eating and the mountain camper rarely loses an opportunity to feast on it. In spring the loud and sonorous hooting of the grouse coming from some giant pine in ravine and cañon, can be heard for long distances, and has such marked ventriloquial effect that it is difficult to locate the boomer or to tell whether he is far away or close at hand.

HEATH HEN (Tympanuchus cupido).

Range: Island of Marthas Vineyard, Massachusetts.

So late as the first year of the present century the heath hen was still more or less common in the Middle and Eastern States. Still earlier the bird was probably rather generally distributed over the territory east of the Alleghenies. We have no reason to be proud of the course taken by legislation in favor of the heath hen, though we need not go back to the last century for even more flagrant examples of the failure of protective legislation. First, as is usual in such cases, all legislation halted till the bird was well on the road to extinction. Then laws were passed, adequate enough, if properly enforced; but they were openly and frankly ignored or repealed or modified no doubt under the time-worn arguments of the present day: the importance to sportsmen of an open season; the need for meat; with the corollary, that the species at that particular period was in no danger. And the result was the same as in the case of the passenger pigeon, and as it will be soon in the case of the prairie chicken.

Marthas Vineyard, Massachusetts, now holds the last pitiful remnant of this fine game bird which, under the protection of the State, has increased from a few couples to about two hundred. How long this little band of survivors will be able to hold fate at bay remains to be seen. It would seem to be the part of wisdom to found other colonies and so increase the chances of survival.

PRAIRIE CHICKEN (Tympanuchus americanus americanus).

Range: Southeastern Saskatchewan and southern Manitoba to eastern Colorado, northeastern Texas, Arkansas, western Kentucky, and Indiana.

"The chicken" is a lover of the open prairie and as a substitute readily accepted the wheat and cornfields of the early settlers, in which it was, and still is, a valuable ally of agriculture. However great its value to the farmer, if we are to judge from present appearances, this fine prairie grouse must soon be written of in the past tense. Formerly abundant all over the Mississippi region from Manitoba south to Louisiana and Texas, and extending as far west as Colorado, to-day only a scant remnant of its former numbers is left, and this remnant is fast dwindling under the combined attacks of sportsmen who should know better, and of gunners who neither know nor care for consequences. Ranging only a short distance north of our boundaries, the prairie chicken is in the strict sense of the word an American game bird, and one must go far to find a finer. Being non-migratory, it is State property, and its fate rests solely with the individual States within which it resides. Considering its past abundance, the fine sport its pursuit affords to the legitimate sportsman, its delicacy for the table, and the valuable service it renders the farmer in destroying his insect enemies, the record of its treatment is a shameful one. In many States no protection whatever was given the bird till its extinction was practically assured, while in the States in which adequate legislation has been enacted, open seasons, too large bag limits, and inadequate enforcement of the laws have produced their inevitable effect. Nothing short of a closed season for a term of years will turn the tide and save this noble bird from extinction.

SAGE HEN (Centrocercus urophasianus).

Range: Sagebrush plains from middle southern British Columbia, southern Saskatchewan, and northwestern North Dakota to middle eastern California, northwestern New Mexico, and northwestern Nebraska.

To make the acquaintance of the sage hen, the largest of the grouse family in the United States, one must leave the region of forests and greenery and betake himself to the barren plains country where grows in abundance the Artemisia or sage brush. This aromatic plant furnishes the bird not only safe cover but also food. Indeed, sage leaves constitute such a large part of the regular fare of the old birds that their flesh becomes strongly tainted, and he must be hungry indeed who relishes it. The flesh of the young, however, is excellent. Owing to its large size and its tameness it makes the easiest of marks, and unless special attention is given to its preservation the bird will before long become rare. The yellow air sacs on the neck of the male are inflated to enormous size during the mating season, and together with his curious antics no doubt suffice to render him irresistible to the female.

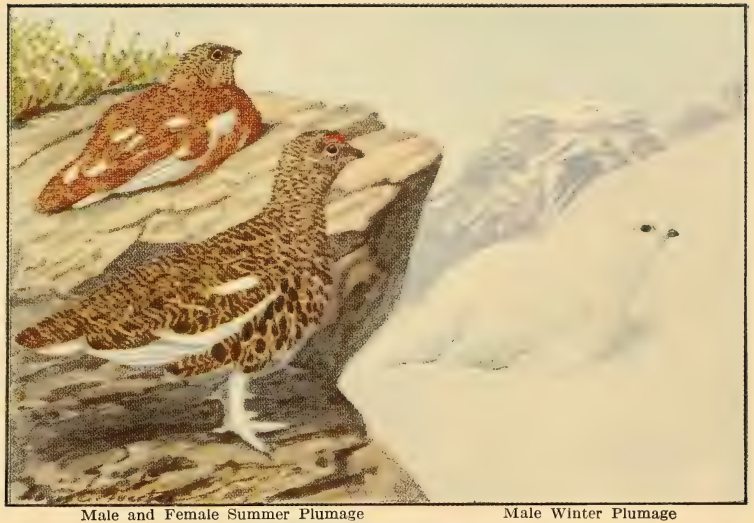
SHARP-TAILED GROUSE (Pediœcetes phasianellus phasianellus).

Range: Central Alaska and northwestern British Columbia east through central Keewatin to central western Ungava, and south to Lake Superior and the Parry Sound district, Ontario.

The sharp-tailed grouse, including under this name its three forms, has an extensive range in the far West, but formerly extended far enough eastward to meet the range of the true prairie hen in Wisconsin and Illinois where, however, it has been nearly if not quite exterminated. As a rule, it inhabited wilder and rougher country than the prairie hen, and never was so abundant. The free use of the shotgun in recent years has taught the sharp-tail some important lessons, and its wariness, seconded by its powerful wings, are sufficient to insure the perpetuity of the species if the Western States in which it lives, profiting by the sad lesson of the prairie chicken and heath hen in the East, afford it the needed protection. Unless, however, its pursuit be carefully regulated, its race will soon be run, and another name added to the lengthening list of extinct American game birds.

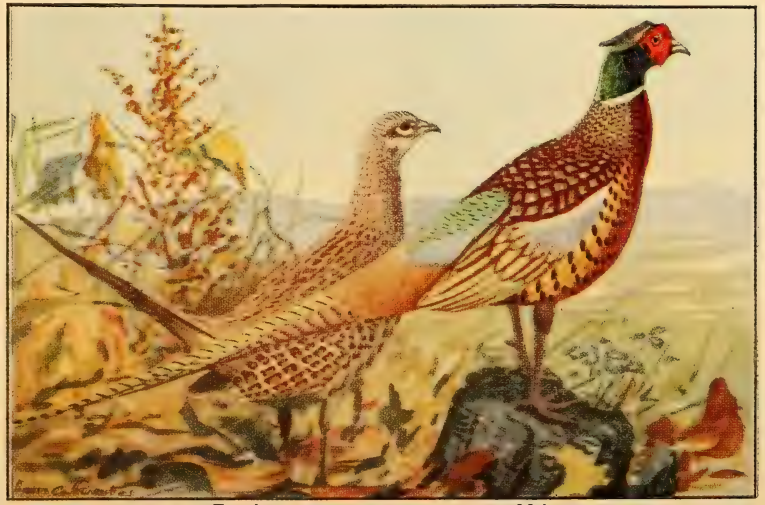
Male and Female Summer Plumage Winter Plumage

WILLOW PTARMIGAN



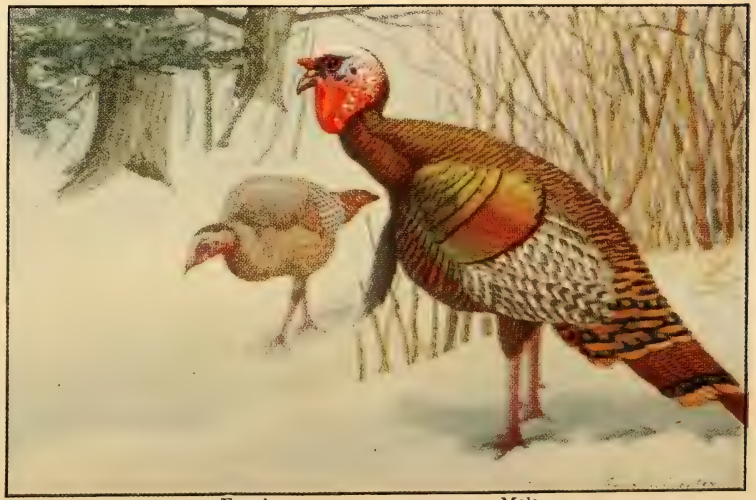
Male and Female Summer Plumage Male Winter Plumage

WHITE-TAILED PTARMIGAN



Female Male

RING-NECKED PHEASANT



Female Male

WILD TURKEY

WILLOW PTARMIGAN (Lagopus lagopus lagopus).

Range: Breeds from northern Alaska, northern Banks Land, and central Greenland south to eastern Aleutian Islands, central Mackenzie, central Keewatin, James Bay, and southern Ungava; south in winter to northern British Columbia, Saskatchewan Valley, Minnesota, Ontario, and Quebec.

To make the acquaintance of the willow ptarmigan in its chosen home one must visit the open tundras on the borders of Bering Sea and the Arctic coast. Though not known to breed south of Labrador, the bird migrates in winter to the St. Lawrence, and occasionally a straggler crosses our own boundary. In Alaska in autumn willow ptarmigan unite in great flocks, numbering thousands, and migrate to the neighborhood of the Yukon and its tributaries, finding there both food and shelter. During the winter ptarmigan play an important role in the life of both the Eskimo and the Indian and are snared and shot in great numbers, often indeed forming the natives' only resource against the ever-recurring periods of want and even famine. On the Kaviak Peninsula the Eskimo have taken advantage of the habitual low flight of the bird—only a few feet above the surface—to net them in a curious way. Nelson thus describes it: "Taking a long and medium fine-meshed fishing net they spread it by fastening cross-pieces to it at certain distances; then taking their places just at sunset in early November or the last of October, on a low, open valley or 'swale,' extending north and south, they stretch the net across the middle of this highway, with a man and sometimes two at each cross-piece, while the women and children conceal themselves behind the neighboring clumps of bushes. As twilight advances the net is raised and held upright. Ere long the flocks of ptarmigan are seen approaching, skimming along close to the snow-covered earth in the dim twilight, and a moment later, as the first birds come in contact with the obstacle, the men press the net down upon the snow sometimes securing fifty to sixty birds."

RING-NECKED PHEASANT (Phasianus torquatus).

Range: First introduced from China into the United States near Portland, Oregon, in 1881. At present established in many other localities, including the following: Puget Sound; Vancouver Island; British Columbia; Cape Cod, Massachusetts; Genesee Valley, New York; and Jekyll Island, Georgia.

This splendid game bird is a native of China, whence it has been introduced into British Columbia, Washington, Oregon, and California, and less successfully in eastern United States. From the first the bird throve wonderfully in Oregon, as introduced game rarely does, and to-day it is probably the most abundant game bird in that State. The pheasant has not escaped censure on the score of its damage to crops, and it is undoubtedly true that it has a keen appetite for corn, peas, grain, and even potatoes. The introduction of a large game bird like the pheasant into our domains is very different from the introduction of a small species like the English sparrow. Unlike the damage done by the sparrow, the mischief of the pheasant can be checked at any time desired by simply extending the open season. Pheasants, however, are naturally hardy and prolific, and once established in a region need only reasonable protection to insure their perpetuation for all time.

WHITE-TAILED PTARMIGAN (Lagopus leucurus leucurus).

Range: Rocky Mountains from northern British Columbia and central Alberta south to Vancouver Island, Washington, northwestern Montana, Colorado, and northern New Mexico.

This hardy ptarmigan, including its Rocky Mountain representative, is an inhabitant of the mountain tops above timber line, and here it lives contentedly summer and winter. Having few foes to contend with, and man being only a casual visitor to its fastnesses, it is likely to continue indefinitely its lonely life among frowning rocks and glistening glaciers. Their mottled plumage in summer and their white robes in winter greatly aid the ptarmigan in their hard struggle for existence, and to some extent at least the birds appear to realize their invisibility. Thus, the members of a flock when surprised will often remain motionless as though depending on their likeness to their surroundings for immunity. Though protected by law, the best protection for the ptarmigan is its protective coloration and its habitat, so remote from the bounds of the arch enemy, man. May they long continue to insure this timid and inoffensive bird immunity.

As is well known, as winter approaches the ptarmigan changes its plumage from a much-mixed dress of rufous, black, and white, to a snowy white. The summer dress is very inconspicuous among the vegetation which the bird frequents, while white winter robes render it no less inconspicuous when the earth is carpeted with snow. Such is one of the many ways in which Mother Nature provides for the safety of her wards.

WILD TURKEY (Meleagris gallopavo silvestris).

Range: Eastern United States from Nebraska, Kansas, western Oklahoma, and eastern Texas east to central Pennsylvania, and south to the Gulf coast.

America may well be proud of this, the King of all game birds. Wherever found, the turkey was originally very plentiful, being sufficiently intelligent and wary to hold its own against the Indian and its numerous natural enemies, particularly the wild cat and cougar. As recently as the late eighties I knew of a flock that had ranged for at least ten years not far from the banks of the Potomac within sight of the Capitol dome. Nature has furnished the turkey a pair of stout legs that enable it to range daily over a wide extent of hill and valley in its search for seeds, grasshoppers, insects, and berries. Inclined to trust to its legs when confronted by danger, it either dashes off at full speed or sneaks quietly away through the bushes, although when forced to fly its powerful wings carry it at a rapid rate. It roosts in the tops of huge trees and this habit is a strong factor for safety. In the seventies I found turkeys very numerous on the headwaters of the Gila in Arizona, and as they probably never had been hunted they were almost as tame as barnyard fowls. One might easily have killed a wagon-load in a day. To what extent the Aztecs had domesticated the wild turkey before the coming of the Spaniard is not known, but undoubtedly it was kept in captivity and had been known to the Montezumas for centuries. It is interesting to note that the turkey originally introduced into Europe from Mexico by the Spaniard was a different subspecies from our eastern wild turkey. Subsequently, the Mexican bird was reintroduced into America, particularly the Eastern States, from Europe. Easily domesticated, our wild turkey even more readily drops its acquired habits and reassumes its primitive mode of life. Thus in several of the Hawaiian Islands the forests have been stocked with domesticated birds which, after a season or two, became as wild as ever.

SURF SCOTER (Oidemia perspicillata) (See page 117)

Range: Breeds on the Pacific coast from Kotzebue Sound to Sitka, and from northwestern Mackenzie and Hudson Strait to Great Slave Lake, central Keewatin, and northern Quebec; winters on the Pacific coast from Aleutian Islands south to San Quintin Bay, Lower California, and on the Great Lakes.

The surf duck is possibly the most abundant of the three species of scoter ducks, and in fall and winter it visits the northern parts of the United States on both coasts in great numbers. It appears off the coast of Massachusetts early in September. Some idea of the vast numbers of these birds may be gained from the observations of Nelson who, late in the breeding season of 1878, saw near Stewart Island, Alaska, a continuous raft of them about ten miles long and from a half to three-fourths of a mile in width. All these appeared to be males and therefore represented only half of the birds of this species breeding in the locality. The surf scoter is a powerful swimmer and a superb diver and is almost as much at home in the surf as a fish. It lives on various kinds of shellfish, chiefly mussels. Naturally, having no means of breaking open the bivalves, it has to swallow them whole, and such are the bird's powers of digestion that it has no difficulty in disposing of the thick shells.

As bearing directly on the question of spring shooting, Mackay states that between April 15th and April 25th he has taken eggs from the ovary of the female scoter that varied in size from that of a cherry stone to that of a robin's egg. Such birds were probably mated some time before, although, as a matter of fact, it is highly probable that the adults of many, if not most, ducks mate for life, and that the pairs consort together till one or both are killed.

AMERICAN BLACK SCOTER (Oidemia americana) (See page 117).

Range: Breeds in northeastern Asia and from Kotzebue Sound to Aleutian Islands, including Near Islands; also on west shore of Hudson Bay, Ungava, and Newfoundland; winters on Asiatic coast to Japan and from islands of Bering Sea south rarely to Santa Catalina Island, California

The American scoter is abundant in Alaska, where it breeds. It is abundant also in winter off the coast of the New England and Middle States, where it associates with the white-winged and surf scoters, the three species at this season possessing similar habits.

At St. Michaels these ducks are never seen in spring until the ice begins to break offshore and the marshes are dotted with pools of open water. Toward the end of May, writes Nelson, they leave the leads in the ice and are found in abundance among the salt- and fresh-water ponds on the great marshes, from the Yukon mouth north and south. The mating is quickly accomplished, and a nesting site chosen on the border of some pond. The spot is artfully hidden in the standing grass, and the eggs, if left by the parent, are carefully covered with grass and moss. As the set of eggs is completed, the male gradually loses interest in the female, and soon deserts her to join great flocks of his kind along the seashore, usually keeping in the vicinity of a bay, inlet, or the mouth of some large stream. A set of fresh eggs was taken on August 3d, and a brood of downy young was obtained on September 9th. Nelson adds: "They are good weather indicators, and frequently, ten or twenty hours in advance of a storm, they come into the sheltered bays, sometimes to the number of a thousand or more. At such times they show great uneasiness and frequently pass hours in circling about the bay, sometimes a hundred yards high and again close over the water, the shrill whistling of their wings making a noise which is distinctly audible nearly or quite half a mile."

SNOW GOOSE (Chen hyperboreus hyperboreus) (See page 121).

Range: Breeds from the mouth of the Mackenzie east probably to Coronation Gulf and Melville Island; winters from southern British Columbia, southern Colorado, and southern Illinois south to northern Lower California, central Mexico, Texas, and Louisiana.

For all practical purposes, the snow goose or white brant may be considered a western bird. It is, however, so much like the greater snow goose, except in size, that the eastern records of the two species are much confused, and it is difficult to determine to which bird any particular account applies. No doubt varying numbers of the lesser snow goose used to visit the Eastern States where, however, the larger goose was and is more numerous. The smaller snow goose breeds in northern latitudes, and in fall migrates in great numbers to our Southwestern States. In the early days of California it was no uncommon sight in winter to see stubble fields and pastures so covered with white brant as to seem like great snow-fields. And very beautiful these snowy tracts appeared under the bright mid-winter sun of California. The ranchmen, however, looked with no friendly eyes on these multitudes of geese, since the tender leaves of wheat are greatly relished by them. When they nip off the blades of the growing grain, little damage is done, and many claim, indeed, that the crop stools the better for it. No doubt, however, great damage sometimes resulted from too frequent cropping, and it was no uncommon practice to hire men to ride from grain field to grain field and keep up a constant fusillade to kill or scare away the geese. Though the multitudes of earlier days no longer visit California, the bird is still numerous there.

BLACK BRANT (Branta nigricans) (See page 121).

Range: Breeds on the Arctic coast and islands from Point Barrow east to near mouth of Anderson River, north probably to Melville Island; common on Siberian coast, Chukchi Peninsula, and west to New Siberian Islands; winters on Pacific coast from British Columbia south to San Quintin Bay, Lower California, and in the interior of Oregon and Nevada.

The black brant is the Pacific counterpart of the brant of the Atlantic coast, and like that bird an object of keen pursuit by the sportsmen of the region it frequents. Like its relative it retires well within the Arctic Circle in summer, and like it also is an exclusively salt-water species, feeding on marine grasses and small marine life. When in search of food, Dawson tells us, the black brant dives as well as a dipper. This brant winters on the Pacific coast in great numbers from Puget Sound southward. Twenty-five years ago it wintered in great numbers in San Diego harbor, and there was so tame and unsophisticated that only moderate skill and caution were necessary to insure a reasonable bag in a very short time. The bird was usually shot from blinds or from points as the flocks passed to and from their feeding grounds. Nelson states that this brant rarely reaches the mouth of the Yukon before May 15th, when the main flight of the other geese has passed, and many of those which remain to breed have already paired.

CACKLING GOOSE (Branta canadensis minima) (See page 121).

Range: Breeds in western Aleutians and from Norton Sound south to northern coast of Alaska Peninsula; winters from British Columbia south to San Diego County, California.

The cackling goose is simply a dwarf form of the Canada goose with somewhat darker colors. It is chiefly limited to the West-Coast States. Nelson found this the most common and generally distributed goose breeding along the Alaska coast of Bering Sea. His spirited account of it as he saw it in the Yukon Delta gives an excellent idea of the nature of the visits of this and other waterfowl to Alaska. He says: "The first goose of the season is hailed with delight by both natives and white residents, who set at work repairing their guns and making ready for the welcome change from a diet of fish, eaten all through the winter, to geese, which soon become the staple. As May advances and one by one the ponds open, and the earth looks out here and there from under its winter covering, the loud notes of the various wild fowl are heard, becoming daily more numerous. Their harsh and varied cries make sweet music to the ears of all who have just passed the winter's silence and dull monotony, and in spite of the lowering skies and occasional snow-squalls every one makes ready and is off to the marshes. The flocks come cleaving their way from afar, and as they draw near their summer homes raise a chorus of loud notes in a high-pitched tone like the syllable 'luk' rapidly repeated, and a reply rises upon all sides, until the whole marsh re-echoes with the din, and the newcomers circle slowly up to the edge of a pond amid a perfect chorus raised by the geese all about, as if in congratulation. Even upon first arrival many of the birds appear to be mated, as I have frequently shot one from a flock and seen a single bird leave its companions at once and come circling about, uttering loud call-notes."

EMPEROR GOOSE (Philacte canagica) (See page 121).

Range: Breeds from Kotzebue Sound south to the mouth of the Kuskokwim, on St. Lawrence Island, and also on Chukchi Peninsula, Siberia, near East Cape; winters from Commander and Near lands east through Aleutians to Bristol Bay and Sitka.

Geese are strong of wing and of adventurous disposition and to most of the tribe a migration of a thousand miles or so is a trifling matter. The emperor goose appears to be as strong as any of its fellows and equally good on the wing, which makes all the more remarkable the limited area it occupies in Alaska. It ordinarily ranges only from the Aleutian Islands to the vicinity of Bering Strait, and the life of the species is practically restricted within this narrow territorial compass.

Nelson enjoyed the unusual opportunity of observing the emperor goose in Alaska. "By the Aleuts these birds are called 'beach geese,'" he says, "from their habit of frequenting the island beaches to feed. These geese arrived in force in the Yukon delta about the first of June, while the river was still under a firm sheet of ice and heavy snow banks covered half the earth. Soon after arrival they paired, the males when mated being very pugnacious. They nested on the salt marshes, and the eggs, five to eight in number, were frequently deposited among the driftwood below high-water mark. The young appear about the last of June and the adults moult from the last of July to the middle of August. Now comes the opportunity of the Eskimo, who set long lines of nets across the marshes, into which they drive the hapless waterfowl which have moulted their quill feathers and cannot fly. The slaughter is enormous and the natives make it worse by killing thousands of young birds for no other purpose than to prevent them being in the way next drive."

AVOCET (Recurvirostra americana) (See page 128).

Range: Breeds from eastern Oregon, central Alberta, and southern Manitoba south to southern California, southern New Mexico, northwestern Texas, northern Iowa, and central Wisconsin; winters from southern California and southern Texas to southern Guatemala.

Though not a game bird in any proper sense, the avocet finds mention here because it furnishes a shining mark for the gunner, and in consequence has practically disappeared from the Atlantic coast. Numbers of avocets are still to be seen along the borders of sloughs and ponds in the far West, though even there the bird by no means enjoys the immunity from persecution it deserves. Its striking colors, its vociferous voice, long neck and bill, and its longer legs, combine to render the avocet so conspicuous that its only chance for safety rests in seeing its enemies before it is seen by them. Its long legs have another function as they enable the bird to wade in the shallows, where its food is chiefly obtained, while its webbed toes enable it to swim easily when need arises. Its slender, upward-curved bill may well excite wonder, but Nature knew what she was about in designing it, for its form admirably adapts it for finding and seizing any prey that may rest on the surface of the muddy ooze, or for probing for various larval forms common in fresh water. It nests on the margins of the ponds which it frequents, and no sooner does an intruder appear than it flies to meet him with loud outcries that unmistakably betray the secret it is so anxious to conceal. The avocet, so innocent and beautiful, is now protected by the Federal law and, as its flesh is worthless, neither sportsmen nor gunners have any excuse for slaughtering it.

DOWITCHER (Macrorhamphus griseus griseus) (See page 128).

Range: Breeding range unknown, but probably northern Ungava; winters from Florida and the West Indies south to northern Brazil.

The dowitcher, or brown back, as it is known in many places, is one of our most important shorebirds, both by reason of its great numbers, its excellence for the table, and the sport it furnishes. If we include under the name "dowitcher" the western form, with its longer bill and other slight differences, the bird may be said to visit all parts of the United States in its migration. It is, however, far more common on the coast than in the interior, and formerly it visited the Atlantic shore in multitudes. The brown-back, however, is one of the most unsuspicious of our shorebirds, and comes to wooden decoys with the utmost readiness. Even after a flock is decimated and the dead and dying cover the ground, the survivors will return again to the fatal spot. No wonder that the multitudes spoken of by many earlier writers no longer visit our shores. There is every reason to believe that the absolute prohibition of the shooting of this bird for a term of years will do much toward rehabilitating the species. Then, with the prohibition of spring shooting and with a small bag limit, it may be possible to retain the brown-back on the list of game birds. But sportsmen may rest assured that anything short of drastic measures will be followed by the extermination of this important wader.

HUDSONIAN CURLEW (Numenius hudsonicus) (See page 132).

Range: Breeds on coast of Alaska from mouth of Yukon to Kotzebue Sound, and on coast of northern Mackenzie; winters from lower California to southern Honduras, from Ecuador to southern Chile, and from British Guiana to mouth of Amazon.

Within the memory of many still living, the jack curlew, as this bird is best known to sportsmen, was the least abundant of the three species of curlew here mentioned. To-day it is the most numerous if, indeed, we still may speak of the Eskimo curlew as a living species. The journeys of the jack curlew north and south rarely take it into the interior, and except when nesting, it sticks rather closely to the vicinity of salt water. It is difficult to explain just why this curlew should have maintained its numbers so well when its relatives have been so reduced, but persecution has taught it the art of self protection and it is now no easy matter to bag a Hudsonian curlew. Then, too, its inaccessible nesting-grounds aid in its preservation, although in this respect it is no better off than was the Eskimo curlew, while the latter bird had the advantage of an oversea route to South America. It is possible, however, that, while the passage over the ocean saved the Eskimo curlew from the onslaught of sportsmen, except in easterly storms which drove it in large flocks on our coast, it exposed the flocks to the fury of the elements during off-shore gales.

The bristle-thigh, our fourth species of curlew, is little known in America. It certainly summers and probably breeds in Alaska, and in fall disperses widely over the South Pacific islands. It is one of the few water birds that winter in considerable numbers in Hawaii.

ESKIMO CURLEW (Numenius borealis) (See page 132).

Range: Breeds on the barren grounds of northern Mackenzie; winters in Argentina and Patagonia.

The Eskimo curlew is an interesting example of the rapidity with which a game bird, apparently numerous enough to defy fate, may be suddenly swept off the face of the earth. Forty years ago, and even less, as many witnesses besides myself can testify, Eskimo curlews might often be found in the markets of Boston, New York, and other large eastern cities, and apparently no one then had a suspicion that the species was nearing its end. Audubon, speaking of his experience in Labrador in 1833, likened the numbers of this curlew to the flocks of passenger pigeons, and as late as 1860 Packard noted a flock in Labrador which was perhaps a mile long and nearly as broad. Not many years ago the fishermen of Labrador and Newfoundland were salting them down by the barrelful for winter's consumption. Because of its uncommon fatness and the excellence of its meat, it was generally known in New England as the "dough bird." No doubt these qualities were the chief cause of the curlew's extinction. Thus the very qualities that should have insured the perpetuation of the species for the benefit of posterity led to its destruction by our improvident selves. The bird is spoken of here as extinct since, to all intents and purposes, it is so, although a few probably still survive. The lesson to be drawn from the destruction of the curlew and the passenger pigeon is that in the case of any given game bird we cannot tell exactly when the danger line is crossed and the safety of the species begins to be threatened. The untimely end of the curlew and pigeon shows that it is the part of wisdom to apply the brakes before the bottom of the hill is reached—in other words, to adopt effective preventive measures before it is too late.

LESSER YELLOW-LEGS (Totanus flavipes) (See page 134).

Range: Breeds from Kotzebue Sound, Alaska, northern Mackenzie, central Keewatin, and southern Ungava to valley of the Upper Yukon, southern Saskatchewan, and northern Quebec; winters in Argentina, Chile, and Patagonia.

The mention of the lesser yellow-legs inevitably recalls to mind its larger relative, for the two birds resemble each other in many ways. Formerly the lesser yellow-legs was extremely abundant over most of the United States east of the Rockies, west of which range it occurs only casually. Like so many of its relatives this bird seeks the seclusion of the far North to nest, and reaches the Mackenzie River region by the Mississippi Valley route the early part of May, thus being, as Professor Cooke notes, about the earliest of our shorebirds to reach high northern latitudes. Naturally it is one of the first to complete its nesting, and it begins its southern journey early in July, the greater number having left the barren grounds by the end of August. Its principal migration route in fall appears to be the Atlantic coast, and not many years ago early yellow-legs shooting was eagerly looked forward to by the impatient sportsmen. No doubt many flocks join the curlew and plover on their journey over the ocean and reach South America by the all-water route. Were a census of the yellow-legs possible it would show a woeful diminution of numbers in the last fifty years. Both Audubon and Nuttall appear to have regarded the bird as one of the most numerous of American waders, and many who are still active hunters can recall the days when big bags were common. The yellow-legs, however, decoys well, and when a flock has been decimated by the first discharge will frequently return at the whistled call. The trustfulness of shorebirds is great, their wiles few and ineffective, and they have to pay the natural penalty, since there is little pity in the heart of the man with a shotgun.

BLACK TURNSTONE (Arenaria melanocephala) (See page 134).

Range: Breeds from Kotzebue Sound south to the valley of the Lower Yukon; winters from British Columbia south to Santa Margarita Island, Lower California.

The black turnstone is the Pacific-coast representative of the common ruddy turnstone of Atlantic shores. Little is to be said of its habits that is not equally applicable to its fellow, of which, except for color, it is a near counterpart. Black turnstones arrive at the mouth of the Yukon about the middle of May. Nelson found it far more numerous in summer on the Bering Sea coast than the ruddy turnstone, and it was nesting wherever found. Like its near relative, the black turnstone resorts to the interior only to nest, and as soon as the young are able to accompany their parents all betake themselves to the coast where on the sea beaches and the rocky islands they find the small marine creatures upon which chiefly they live. They winter mostly on the coast of Lower California. At the present time the black turnstone is more numerous than the ruddy. Turnstones are still comparatively numerous on the west coast, chiefly no doubt owing to the abundance of more highly prized game. Indeed, in California and other Pacific States, it is only in comparatively recent years that the smaller species of shorebirds have received any attention at the hands of sportsmen, or even gunners. When I first visited San Diego in 1887, the shores of the northern end of the bay were dotted with many kinds of shorebirds, including curlew. They were very tame, and apparently were never disturbed by a hostile shot. Indeed they were considered hardly fit to eat, and certainly not worth powder and shot when ducks, brant, and geese were to be had with very little trouble.

Photo by Stanley Clisby Arthur. Courtesy of the Conservation Commission of Louisiana

A HAPPY FAMILY: MALLARDS "TIPPING UP" ON THE LOUISIANA STATE GAME PRESERVE

The water bottoms of the lowlands grow duck food in abundance

and to-day there are probably not far from five millions who are interested in the pursuit of game!

The enormous number of men in a single State who hunt appears from a statement of the Secretary of the Game Commission of Pennsylvania, who says that "during the season of 1913 there were 305,028 resident hunter's licenses issued in this State. During the season of 1914, from reports at hand, there were fully as many licenses issued.

"When we consider that the landowner with his tenants and their families may hunt under the provisions of law without paying this license, and add to this those who hunt in violation of law, we are led to believe that fully 100,000 more men hunted in this State during each of these seasons than were licensed, making all together an army of more than 400,000 men, who, for a certain period and for good reason, are permitted to destroy game that in the aggregate amounts to millions of pieces and thousands of tons in weight."

Large as the figures seem, and they are the largest for any State in the Union, it should be remembered that they represent but 5 per cent of the total population of Pennsylvania, while in the Northwest, notably in Idaho and Montana, more than 10 per cent of all the people are licensed hunters.

What this army of five million hunters means to the large and small game of America can better be imagined than described! Modern guns and ammunition are of the very best, and they are sold at prices so low as to be within the reach of all. Added to these very efficient weapons for killing small game, are innumerable devices for killing waterfowl, as sneak-boats, punt-guns, swivel-guns, sail-boats, steam-launches, night floating, night lighting, and others.

While it is true that most of these devices are illegal, they are nevertheless in use at the present time, and in out-of-the-way places offenders are difficult of detection, especially as they are often intrenched behind local sentiment, which countenances and even encourages the practice because "it brings money into the county." To the above devices for the destruction of game must be added the automobile, and it may be doubted if any other modern invention is so potent for harm. It is possible for a party of three or four in a speedy machine to hunt over territory in a single morning that formerly would have required a week or more.

MONEY VALUE OF GAME BIRDS

Passing by for the moment all esthetic considerations, the money value of the vast number of game birds that breed within the several States or visit them in migration is so great as alone to entitle the birds to careful protection. This point of view is being taken by several States Thus Oregon values her game resources, which consist in no small part of game birds, at five millions of dollars annually, while Maine and California respectively claim their game to be worth twenty millions annually.

To permit the extermination of any part of this valuable food asset, valuable alike to State and Nation, by continuing the wasteful methods of the past is an economic crime against present and future generations. And here it is important to point out that while the majority of our ducks, geese, and swans breed outside our jurisdiction they winter within our own borders. Failure adequately to protect them, therefore, in their winter quarters means their ultimate extinction

SALE OF GAME BIRDS

Intimately connected with the problem of conserving our wild game is the killing of game for market. Many of those who have studied the subject earnestly do not hesitate to express the conviction that under the conditions now prevailing in the United States the conservation of our ducks, geese, and shorebirds is impossible if their sale in open market continues.

In considering the present effect of the sale of wild game, it must not be forgotten that the demand for game in the United States has enormously increased in the last decade. Even with our present population the market demand is infinitely greater than the supply, and all

the ducks and geese that now breed within our borders and that visit us from the North would not suffice to supply the inhabitants of New York and Chicago, to say nothing of a dozen or twenty of our other large cities, for more than a few short weeks.

Indeed, were the market demand for game to be fully satisfied, all the winged game of America killed during the next two or three seasons could be marketed and eaten. Reaching the great markets in the comparatively small quantity that it now does, game of all kinds commands prohibitive prices for any but the wealthy. As Forbush justly remarks, the present market price of quail is so high as practically to amount to a bounty on the birds' heads and is a constant temptation to the market hunter to kill his quarry, despite State or Federal law, in season and out.

STATE PROTECTIVE LAWS

State or colonial ownership of game was indeed early recognized, but only grudgingly in so far as it was restrictive of the right of the individual to hunt wild game when and where he pleased. Everywhere the feeling prevailed that all wild game belonged to the people, to be killed whenever necessity or inclination prompted, and it may be said that no little of this feeling remains to the present day. The change from the old belief that wild game belonged to him who could take it, to the theory of State ownership of game, marked a long step forward in game preservation. To-day few principles of American law are more firmly established than this, though it was not until 1896 that the principle was formally enunciated by the Supreme Court of the United States.

If the several States, under the principle of State ownership, have failed adequately to protect their game, it has not been for lack of game legislation. Even in the colonial period laws regulating the manner of taking game were passed. As early as 1708 heath hens, ruffed grouse, quail, and wild turkeys were protected in New York; but it was not till 1791 that woodcock were given legal protection. In 1710 a law was enacted in Massachusetts prohibiting the use of boats and canoes with sails, or canoes disguised with hay, sedge, or seaweed, for hunting waterfowl.

Snipe were protected in Massachusetts in 1818, and ducks in Rhode Island in 1846; Connecticut and New Jersey protected their doves and insectivorous birds in 1850, and in 1851 Wisconsin passed protective laws in favor of the prairie chicken. It is worth noting in connection with game legislation that it was not until 1878 that the first bag-limit law was enacted. This limited the bag of game birds in Iowa to 25 in one day—a limit which has remained practically unchanged for 37 years.

Since early times, and especially of late years, game legislation has so flooded the country that it is difficult to keep track of it. Over 1,300 laws were enacted during the first decade of the present century (1901-1910). Despite this great volume of legislation, some birds, as geese, were never given a close season in California, Texas, Arkansas, and other States.

STATE GAME LAWS DIVERGENT

It needs only a glance to show that State laws and regulations affecting game differ widely, even in adjoining States; thus a game bird may be adequately protected by law in one State and be only partially protected in a neighboring State, or not protected at all.

Moreover, the history of game preservation since colonial times in many States reveals no well-defined policy, but a series of regulations constantly changing according to the ever-shifting points of view of State and game officials and the political exigencies of the moment. Even the funds raised by the sale of hunting licenses, in most States ample for effective enforcement of the laws, have not always been devoted to the cause of protection, but often have been diverted to very different uses.

So great is the divergence in the nature and purpose of game legislation of the several States that there would seem to be little hope that the inconsistencies and shortcomings will ever be reconciled. Some who do not realize what has been

Photo by Stanley Clisby Arthur. Courtesy of the Conservation Commission of Louisiana

WILD GEESE OVER MARSH ISLAND, LOUISIANA

Five varieties of geese seek the succulent grasses of Mrs. Russell Sage's gift and in flocks that defy count. "Several of the States now have extensive game preserves or refuges of their own, and a large number of private sanctuaries have been set apart, aggregating many square miles in extent. Conspicuous examples of these are the Ward-McIlhenny preserve, dedicated to wild-life conservation by Charles Willis Ward and E. A. McIlhenny; Marsh Island, acquired through the generosity of Mrs. Russell Sage; and the Rockefeller preserve. All these are in Louisiana" (see text, page 155).

accomplished in recent years are inclined to despair.

Meantime, after a century of experiment by the States, the depletion of our game birds continues, and the end of several species is in plain view. It must be evident to all that, so far as the conservation of wild life is concerned, State control has proved a failure. Not a single State has succeeded in adequately protecting its own resident game, to say nothing of the game that migrates through it.

FEDERAL MIGRATORY BIRD LAW

It is the belief of many that what the States have failed to do for the conservation of our bird life can be accomplished by the Federal government, and they further believe that the act approved March 4, 1913, commonly known as the Federal Migratory Bird Law, marks a long step in advance in game protection. By this act the migratory game and insectivorous birds which do not remain permanently within the borders of any one State or Territory are declared to be within the custody and under the protection of the government of the United States.

This act, be it noted, provides protection only for game and insectivorous birds that migrate; hence many of our finest game birds, like the bob-white, valley quail, mountain quail, ruffed grouse, prairie hen, sage hen, blue grouse, wild turkey, and others, being non-migratory, have been left in charge of the several States in which they reside. Here we may leave them, trusting that, notwithstanding past failures, the measures enacted for their benefit will stay the fate with which most of them are threatened.

Migratory birds are on a very different basis from others. Such of the ducks, geese, and shorebirds as still breed within our limits, including Alaska, migrate early to more southerly localities, where they winter. Some of them, in fact, especially the shorebirds, pass beyond our borders and winter south of the tropics. But by far the great majority breed in foreign territory far to the northward of our possessions, and we have no claim on them save as they tarry on their journey for a time along our coasts or on our lakes and rivers or winter in the Southern States.

It seems eminently fitting that these migrants, as they traverse our territory, feeding in one State to-day, in another State to-morrow, should be under Federal control, subject to such regulations as seem likely to preserve the species. The law giving Federal protection has, after a year's trial, met with general approval. Moreover, although its constitutionality has been questioned, its main purposes have been indorsed by the great majority of sportsmen, though among them are many who dissent from certain regulations because they abridge the privileges enjoyed under State law.

In this connection it may not be out of place to direct the attention of sportsmen, many of whom seem to have somewhat misconstrued the purpose of the Federal law, to the fact that the intent of the law was not primarily to increase shooters' privileges by lengthening the open season and enabling them to kill larger bags of game, but to preserve game birds in general, more particularly the ones threatened with extinction.

If the accomplishment of this laudable end curtails to some extent the present privileges of sportsmen, they should not complain, since the ultimate result of the law, if it be enforced, will be largely to increase the number of our game birds. Should it then somewhat curtail the privileges of the present generation of sportsmen, it will at least insure to future generations the perpetuity of our game birds.

Here it may be pointed out that if the present Migratory Bird Law, now before the United States Supreme Court, should fail to meet the test of legal requirements and be pronounced invalid, bird conservationists need not be discouraged, since two courses are open: first, so to amend the law that it will stand every legal test; second, to obtain a constitutional amendment which will effect the desired end.

Amendments to our constitution are proverbially difficult to secure, but who can doubt that with the widespread interest in bird life of the present generation of Americans such an amendment can be obtained in due time.

Photo by Stanley Clisby Arthur. Courtesy of the Conservation Commission of Louisiana

PINTAIL IN FLIGHT: THE LOUISIANA STATE GAME PRESERVE OFFERS SANCTUARY TO BILLIONS OF MIGRATORY WATERFOWL EVERY WINTER

SPORTSMEN AS CONSERVATORS OF GAME

There are many good citizens in the United States who believe that hunting is wrong and who consider all sportsmen arch enemies of wild life. There are sportsmen and sportsmen, and the genuine lover of gun and dog will almost invariably be found to be a lover of nature and at heart a conservationist of wild life.

Be the sportsman what he may, the sportsmen of the United States, as a body, constitute a very important factor in the present struggle to keep wild creatures from total extinction. Many of us who love wild life and who long ago abandoned the use of the gun, nevertheless believe that game exists for reasons other than esthetic. Only extremists insist that all animal life is sacred and must on no account be taken. Birds, in addition to their esthetic value and their importance as allies of the farmer in his warfare on insects, are important as food.

They are also important because they furnish a healthful and exhilarating pursuit to an army of men who at certain seasons take to the woods and fields and because of their outdoor life make better men and better citizens.

BOTH FEDERAL AND STATE LAWS NECESSARY

Since game birds have such strong claims on our interests, it cannot be doubted that both State and Federal laws are necessary for their protection, and the more cordial and complete the cooperation between State and Federal officers, the more effective will be the administration of the laws. Even more essential in the long run is the recognition of the importance of our wild life by the people at large and their hearty sympathy and active coöperation as individuals with efforts for its protection.

Nor should sportsmen and sportmen's clubs be backward in cordial coöperation, since they are among the chief beneficiaries of measures for the preservation and increase of game birds. The need is not for more laws, but rather for fewer, simpler, and more comprehensive statutes. It is the multiplicity of legal enactments subject to constant change, coupled with their non-enforcement, that has been largely responsible in the past for the general decline in the number of our game birds. Fewer laws with better enforcement should be the rule for the future.

THE PRESERVATION AND INCREASE OF GAME BIRDS IS FEASIBLE

A few words may be added on certain practical means, other than restrictive measures, for the preservation and increase of our game birds. One of the most effective is the establishment of sanctuaries where birds may safely resort to nest and feed during migration.

The Federal Government has already demonstrated the utility of this method and has established no fewer than 68 bird reservations in different parts of the United States, including Alaska. If the national parks, large game preserves, and national monuments are added to the list, the government now has more than 100 sanctuaries, some of which include thousands of acres, where birds of all kinds are protected at all seasons.

The example thus set by the government has stimulated both State authorities and private individuals. Several of the States now have extensive game preserves or refuges of their own, and a large number of private sanctuaries have been set apart, aggregating many square miles in extent.

Conspicuous examples of these are the Ward-McIlhenny preserve, dedicated to wild-life conservation by Charles Willis Ward and E. A. McIlhenny; Marsh Island, acquired through the generosity of Mrs. Russell Sage; and the Rockefeller preserve. All these are in Louisiana. That private means are being thus devoted to the public welfare through the protection of birds speaks well for the future.

In furtherance of the sanctuary plan, there would seem to be excellent reasons why the several States, in the interests of their citizens, should set apart tracts of land, and specifically designate them as bird sanctuaries, where all shooting should be prohibited, as it is in the greater part of the District of Columbia. Such tracts, especially if public parks, not only serve the important end of

Photo by Stanley Clisby Arthur. Courtesy of the Conservation Commission of Louisiana

ONE OF THE LAST OF HIS RACE

The millinery trade has almost caused the trumpeter swan to join the passenger-pigeon in oblivion. A male bird of this rare species visited the Louisiana State Game Preserve the winter of 1914-1915 and it is hoped this sanctuary will attract others.

conserving bird life, but possess added value to the public as pleasure resorts. They serve also the cause of education by providing readily accessible places where the habits of wild birds may be studied by school children and others.

VALUE OF BERRY-BEARING SHRUBS

Another important way of caring for both game and insectivorous birds is to provide food for them, especially in winter and during deep snows. This method is particularly effective, since the expense entailed is small and it can be practised everywhere by private individuals. Pittsburgh has a special superintendent whose peculiar care is the birds in the public parks. Several States, as Massachusetts, Connecticut, Vermont, Delaware, and Pennsylvania, have, or recently had, State ornithologists, whose usefulness in practical ways is unquestioned. Their duties include the study of the habits of birds from the economic point of view, and the preparation of reports thereon to aid in the framing of protective legislation.

The planting of berry-bearing shrubs and trees in public parks and along public roadsides is another effective method of caring for our bird life. Already many women's clubs, quick to recognize their opportunity, have taken up this work and are urging park commissioners to make special provisions for the needs of our birds. Such methods bear more directly on the welfare of our seed-eating and insectivorous birds, but they also have a beneficial effect on game birds, especially bob-white and the ruffed grouse.

PRIVATE AND STATE ORGANIZATIONS

Such organizations as the Meriden Bird Club, of New Hampshire, are especially to be commended. This is a local community club as distinguished from the public or private preserve or sanctuary. Its purposes, as stated in its constitution, are as admirable as they are direct and simple: "The objects of this club shall be the increase and protection of our local wild birds, the stimulation of interest in bird life, and the gradual establishment of a model bird sanctuary."

Of wider scope and aims are such organizations as the National Association of Audubon Societies, with its many affiliated State societies; the American Game Protective Association; the Wild Life Protective Fund; and the State Game Protective Associations. The work of these various bodies, individually and collectively, has proved a most important factor in the nation-wide movement to conserve our valuable bird life.

Of recent years instruction as to the economic value of birds and the best ways to conserve them has received much attention in the public schools of many States, and the results are likely to prove fruitful, both now and in the years to come.

MANY GAME BIRDS CAN BE REARED IN CAPTIVITY

Finally, the artificial propagation of our game birds has a direct and important bearing on their present and future welfare. It has already been demonstrated that bob-white and other quail can be reared in captivity and used to stock depleted covers, while Canada geese, mallards, black ducks, wood-ducks, and others of the goose and duck tribe can be reared under suitable conditions almost as readily as domestic fowls and be used to stock public lakes and ponds. This is a work which may properly be undertaken by State game commissions and in fact has already been begun.

If in consequence of the cessation of spring shooting the numbers of our waterfowl and shorebirds increase, as is confidently expected they will, the sale of hunting licenses in most of the States will provide ample funds for all necessary experiments in the artificial propagation of game on a large scale, and thus be an important factor not only in preserving the species now in danger, but in furnishing game for sport and food.

LIST AND INDEX OF AMERICAN GAME BIRDS

Name of bird	For picture see page	For description see page
Avocet	128	147
Baldpate	111	110
Barrow's Golden-eye	115	114
Bob-White	140	141
Brant	121	120
Brant, Black	121	120
Bufflehead	115	114
Canvasback	113	112
Clapper Rail	123	122
Coot	125	124
Crane, Sandhill	123	122
Whooping	123	122
Curlew, Eskimo	132	148
Hudsonian	132	148
Long-billed	132	133
Dove, Mourning	136	137
Dowitcher	128	147
Duck, Baldpate	111	110
Barrow's Golden-eye	115	114
Black	109	108
Bufflehead	115	114
Eider, King	117	127
Eider, Pacific	117	116
Eider, Steller's	117	116
Eider, Spectacled	117	127
Fulvous Tree-Duck	119	118
Gadwall	111	126
Golden-eye	115	114
Golden-eye, Barrow's	115	114
Greater Scaup	113	112
Harlequin	115	114
Labrador	117	116
Lesser Scaup	113	127
Mallard	109	108
Merganser, American	109	108
Merganser, Hooded	109	126
Merganser, Red-breasted	109	108
Old Squaw	115	114
Pintail	113	112
Red-head	113	112
Ring-necked	113	127
Ruddy	119	118
Scaup, Greater	113	112
Scaup, Lesser	113	127
Scoter, American	117	146
Scoter, Surf	117	146
Scoter, White-winged	117	116
Shoveller	111	126
Teal, Blue-winged	111	110
Teal, Cinnamon	111	126
Teal, Green-winged	111	110
Widgeon, European	111	110
Wood	119	118
Eider, King	117	127
Pacific	117	116
Spectacled	117	127
Steller's	117	116
Gadwall	111	126
Gallinule, Florida	125	124
Purple	125	124
Godwit, Hudsonian	132	133
Marbled	132	133
Goose, Blue	121	120
Brant	121	120
Goose, Brant, Black	121	146
Cackling	121	147
Canada	121	120
Emperor	121	147
Snow	121	146
White-fronted	119	118
Grouse, Dusky	142	143
Franklin's	140	141
Ruffed	140	141
Sharp-tailed	142	143
Spruce	140	141
Heath-hen	142	143
Killdeer	136	137
Knot	128	129
Mallard	109	108
Merganser, American	109	108
Hooded	109	126
Red-breasted	109	108
Pheasant, Ring-necked	144	145
Pigeon, Band-tailed	136	137
Passenger	136	137
Pintail	113	112
Plover, Black-bellied	134	135
Golden	134	135
Upland	130	131
Prairie-chicken	142	143
Ptarmigan, White-tailed	144	145
Willow	144	145
Quail, Bob-White	140	141
Chestnut-bellied scaled	138	139
Gambel's	138	139
Mearn's	140	141
Mountain	138	139
Scaled	138	139
Scaled Chestnut-bellied	138	139
Valley	138	139
Rail, Clapper	123	122
King	123	122
Virginia	125	124
Redhead	113	112
Sage-hen	142	143
Sanderling	130	131
Sandpiper, Pectoral	130	131
Spotted	130	131
Scoter, American	117	146
Surf	117	146
White-winged	117	116
Shoveller	111	126
Snipe, Wilson's	128	129
Sora	125	124
Stilt, Black-necked	128	129
Swan, Trumpeter	121	120
Teal, Blue-winged	111	110
Cinnamon	111	126
Green-winged	111	110
Turkey, Wild	144	145
Turnstone, Black	134	148
Ruddy	134	135
Widgeon, European	111	110
Willet	132	133
Woodcock	128	129
Yellow-Legs, Greater	134	135
Lesser	134	148

NATURE'S TRANSFORMATION AT PANAMA

Remarkable Changes in Faunal and Physical Conditions in the Gatun Lake Region

By George Shiras, 3rd

Illustrations by the Author and H. E. Anthony

THE world-wide interest in the Panama Canal, from an engineering standpoint and the great economic changes destined to follow the use of this new channel of trade and intercourse, has been evidenced by thousands of visitors and the many articles bearing upon the various aspects of this wonderful work.

One of the essential features in the plan of construction has been somewhat subordinated when viewing the project as a whole, namely, Gatun Lake; for beyond regarding it as a convenient part of the passageway across the Isthmus, few realize that it is the basis of the whole scheme. Not only is it the largest fresh-water lake ever created by man—a navigable viaduct almost bridging the two oceans and reached by terminal elevators in the form of locks—but, in addition, a vast reservoir for the adjoining watersheds, assuring throughout the year a sufficient water supply for the operation of the locks, for electric power, for the establishment of inland fisheries, and for potable and other domestic uses, besides allowing greater freedom in the movement and speed of vessels and the opening up of the many lateral valleys to local navigation.

A BOUNTIFUL WATER SUPPLY

The great saving of time and money in thus utilizing a part of the surface of this reservoir, instead of excavating a narrow and deep canal all the way across the intervening land, was inconsequent, however, compared with the original purpose—a continuously abundant supply of water for operating the canal locks—thus insuring the regular daily movement of vessels throughout the year. Without the converging watersheds of 1,400 square miles, without a large natural basin for impounding these waters, and so located that a water-tight and stable dam could be built across the Atlantic end, only a sea-level canal could have been considered—a much more costly and probably an impracticable scheme.

However narrow the Isthmus, nature has aided as much more in a combination of low rolling hills, with wide valleys only a little above sea-level, an almost continuous rainfall, while the compact but easily excavated soil made the canal construction rapid, its banks water-tight, and the subsequent use of much of the excavated material a great economy in the building of the great earth dams.

The original plans, under which the initiatory work of the French syndicate was begun, called for a much smaller lake, ignoring the advice of its most brilliant engineer, M. de Lipiany, by not including the waters of two large rivers—the Gatun and the Trinidad. Judging from the amount of water required at the locks and for various other purposes, the de Lessep plans seem fundamentally defective.

BIRTH AND GROWTH OF THE LAKE

When the information came from Panama that the great basin for holding the waters of the proposed Gatun Lake was finally completed by the long embankment at the north end, thus closing the only gap in the rim of hills left open by nature, and that month by month the gathering waters of tributary streams were slowly covering the lowlands, creeping up the wild tangled valleys, drowning the mighty forests and the rank tropical jungles, flooding out native villages and destroying scattered plantations, marooning wild creatures like the monkey, ocelot,

NEWLY FLOODED FOREST ON THE RIO TRINIDAD: IN THE PHOTOGRAPH AN IGUANA CAN BE SEEN ON THE UPRIGHT STUMP AND A WHITE EGRET ON THE LOG AT THE CENTER

The new lake of this region has now an extent of 164 square miles and a depth in places of 70 to 90 feet

peccary, armadillo, and the sloth on hilltops unexpectedly converted into permanent islands, submerging the mud-flats of the herons and the ibis, driving the deer, the jaguar, the tapir, iguanas, and monster snakes through the rising waters to less hampered retreats, and opening up a new and larger home for the swamp alligator and the stream-confined fish, it seemed a proper time to study and to attempt a record of these changes.

While necessarily representing a transient condition, where organic decay and the dispersal of wild life was epochal only in the sense of marking a definite break between the past and the present, yet in the very processes of transition there would be much of present interest and of possible future value.

Gatun Lake, at a surface elevation of 85 feet above the sea-level, is estimated to cover 164 square miles, and extends not merely over the previously existing swampy ground of the Chagres Valley, but it has risen so far above the floor of the lowlands as to extend for miles between the hills, forming estuaries, lagoons, and ponds, turning rapid, unnavigable streams into deep, sluggish rivers, and converting hilltops into beautiful islands, some of them miles in length, while the thousands of acres of flooded and fallen timber, into which stretch or circle narrow necks of land, practically defy any accurate estimate of the so-called shore-line of the new lake.

SHORES UNSURVEYED

From what we could learn through inquiry and exploration, no one knows the size, shape, or location of much of the partly submerged lands; nor can satisfactory surveys now be made at the water-line without cutting down possibly a hundred miles of dying trees and bushes. Even then a 5-foot fluctuation in the lake's surface, as may be expected between the dry and wet periods, will necessarily vary the superficial area of the lake and the lines of the shore to a considerable degree.

Some day, however, the warm and ever-present waters will destroy the obstructing forests, and then the heretofore half-shrouded lake will glisten, near and far, in the tropic lights, while the surrounding shores, each bay and promontory, the islands big and little, will become defined by a new and permanent border of bamboo and other semi-acquatic growths.

When, in the fall of 1911, the locks of the spillway at the Gatun dam were closed, so as to begin the flooding of the Chagres Valley for the first and final time, the immediate use of the then shallow waters invited the coming of the gasoline launch and native dug-out. In the beginning this great dam, one and one-half miles in length and 100 feet wide at the summit, towered many feet above the incipient lake, greatly reducing the effect of the trade winds, while the numerous islands and projecting points gave additional shelter to all small boats returning against the wind.

Each week, but usually on holidays and Sundays, canal employees went down the lake on hunting trips, and an easy and safe return could be counted on. But on our arrival, early in 1914, the lake had risen to its full height; island after island and point after point had sunk out of sight forever, while the steady diurnal winds of the Caribbean Sea, whirling across the narrow and now low crest of the embankment, brought the waves into life a few yards away, ever increasing in size in the long course down the lake.

LIKE A WORK OF NATURE

As one gazed across the broad expanse of water, with its ruffled surface, it was hard to realize that it was the recent creation of man or responding for the first time to the action of the tropic winds.

On one occasion when coming to Gatun after gasoline the launch encountered a heavy head sea in mid-lake and the small pump was unable to keep the boat clear of the breaking waves, so that it nearly filled, putting the engine out of service, and we drifted back several miles into a dead forest in peril of being wrecked by a collision with some large, tottering tree or buried beneath a falling top brought down by the impact.

Like most natives of the Southern Hemisphere, the Indians of Panama,

OUR HOUSE-BOAT CRUISING IN THE FLOODED FOREST OF GATUN LAKE

It was because of the flooding of the Gatun and Chagres valleys by the huge dam at the Gatun locks, thus causing abrupt changes in the faunal conditions, that an expedition was undertaken. The house-boat formed the base camp, from which trips were made by launch or small boat, sometimes along rivers which heretofore have been inaccessible, owing to shallow water. The house-boat had sides of cheese cloth and copper screen to keep out mosquitoes (see page 165).

when using the interior waterways for travel, employ the dug-out, or *cayuca*, in which they are experts in poling or paddling the swiftest of streams (see page 163). On the first coming of the lake it was easy to reach the construction towns along the shore in boats heavily laden with fruits and other products, but as the waters rose and the wind and waves began to interfere it was discovered that not one among them all knew how to handle a canoe safely under such conditions, so that now the lake is paddled in the stillness of the night or by dodging in and out through the flooded forests near the shore.

Eventually, however, skilled canoemen will be able to buffet the waves, and then this picturesque craft will be seen from the great steamers gliding across the white-tipped surface, so seemingly insignificant to ships that have just come in from the turbulent waters of adjacent seas.

DOOMED TO SLOW STARVATION

Probably in no other country is there such an interesting area continuously covered with deep, still waters, where much of the original timber is standing. Here one can find trees slowly dying, with great pendant termite nests filled with restless ant-like creatures, isolated and doomed to slow starvation (see page 166).

Here are trees that died on the first coming of the flood and others green and apparently vigorous, with roots and trunks under water for several years. On the decaying branches are many beautifully colored orchids—tillandsias, ferns, vines, and mosses—replacing for a time the lost foliage and tropic blooms, while upright stumps and floating logs

The common method of navigation of small streams by the native Panamans is by means of the *cayuca* or dugout, which varies in length from 8 to 35 feet and is cut from a single tree. These boats are used by the natives for bringing fruit and produce to market, and it is a common sight to see them loaded with sugar-cane cut in sections 8 or 10 feet in length.

are green with long-leaved plants, the intervening pools bearing purple clumps of drifting water hyacinths (see page 167).

Here, too, are floating islands, with waving grasses and slender reeds, destined to live forever, and when anchored by projecting snags or hemmed in between tree trunks, will gradually become great tremulous bogs, unsafe alike for man and all sharp-hoofed animals, but a place of sunshine and of comfort to the coming alligators, a refuge and a feeding place for the herons, ibises, and other water birds, long exiled on the shoreless trees, where little frogs will be speared and many a minnow lifted from along the ragged edges.

Day after day we explored these unknown wastes, ever alert in avoiding the sudden fall of tree-tops and massive limbs weakened by inward decay or by heavily burdened masses of parasitic plants. Twice we were nearly overwhelmed and once the camera and flashlight at the edge of the shore were buried out of sight.

The anticipated encroachments of the lake resulted in a timely relocation of the Panama Railroad along the Chagres Valley (as shown in the comparison maps, pages 180 and 181); but most of the foot-trails were obliterated and the narrow, well-defined canoe routes became lost in a maze of flooded forests, the tortuous channels no longer indicated by wooded banks or rapid currents.

WHERE A RIVER GOT LOST

In going up the estuary formed by the flooded valley of the Trinidad, there was no suggestion of the swift stream of former years, once navigable for many miles in a canoe, for now the broad, stagnant, forested waters were covered here and there by floating vegetation and driftwood that often blocked the old

A STUDY IN TREE TRUNKS AT THE NORTH END OF GATUN LAKE

route, making travel uncertain. Then resort must be had to the compass, for here no land was visible, no blazed trails or flowing waters to indicate direction, and one might be lost for hours in locating the temporary anchorage of a launch or house-boat.

The timidity of the natives in exploring these flooded forests is in keeping with their fear of the open lake, and as guides we found them quite useless in reaching hunting grounds by boat. Accustomed to follow the ancestral trails and streams, knowing nothing about a compass or the direction indicated by the prevailing winds or the position of the sun, we could not trust any of the Indian guides to lead in exploration.

At Gatun we found several canal employees, and one in particular, who could take a launch at full speed through densely timbered districts, swerving here and there with wonderful skill and seldom in doubt of the direction taken or where and when the launch would reach the open water.

THE ADVANTAGES OF A HOUSE-BOAT IN COLLECTING AND EXPLORATION

Many years' use of a house-boat in the wilderness about Lake Superior had shown its great convenience as a movable habitation and its great superiority over tent or cabin in most places accessible by water. In the tropics such advantages I felt would be tenfold greater.

Before starting for Panama arrangements had been under consideration for converting a small scow or flatboat into a house-boat by merely erecting a frame that would support a canvas roof and wire netting along the sides—simple changes, excluding the sun or rain and visits from many forms of troublesome insects. With a swift and powerful launch we could tow the house-boat from place to place, using the former for extended daylight excursions.

On arriving at the lake it was found that the expectation of getting a small scow was too sanguine, for the suitable ones were in continuous service by the government and the others too bulky for use. Rather than take the time necessary in building, we were able to convert a floating boat-house into a very comfortable house-boat. In size it was 9 x 30 feet, with a zinc roof, a covered tool-house at one end, suitable for storage purposes, and the sides and front open.

By flooring over the slip in which a launch had been berthed, putting on a V-shaped prow at the towing end, and tacking on screening between the roof and floor, the craft was superior to the kind originally sought, except for its heavy draft and a deck so low that it would be awash when running into a head sea.

ADVANTAGES OF HOUSE-BOAT LIFE

We now had all the comforts of a commodious yacht, very much freer ventilation, and a continuous opportunity of viewing the landscape or wild life from the open sides, besides plenty of room for storing a bulky outfit where it would always be accessible, with pleasant quarters for identifying and preserving the material collected.

Cots and hammocks for beds, a large oil stove, a thirty-gallon tank for pure water, a long table hinged to the side of the boat for the serving of meals and as a work-bench, comprised the additional improvements.

With the house-boat one escapes the cumulative annoyances connected with breaking camp every few days, the repacking of fragile or loose articles, and the selection and clearing out of new sites in the ever-present brush, where giant vine-tangled trees, too formidable for the axe, exclude the light, air, and every outlook, converting the jungle camp into a gloomy hothouse, surrounded by prickly plants and subject to the raiding ants in daytime, the fever-bearing mosquitoes at night, and the vicious activity of red bugs and ticks, unlimited in the hours of visitation.

My companion on the trip, Mr. H. E. Anthony, of New York, representing the American Museum of Natural History, came as my guest for the purpose of studying and obtaining specimens of mammals, and he proved a most agreeable and capable collector, while C. J. Anderson, of Michigan, a guide and as-

A TERMITE'S NEST IN THE FLOODED DISTRICT

These ant-like creatures were still active, but doomed to slow starvation

sistant on many former expeditions, accompanied me again in the same capacity.

In the interim of selecting and then reconstructing the boat-house, we made a number of excursions by launch, the principal ones up the Gatun and Chagres valleys, referred to elsewhere.

A STRANGE-LOOKING CRAFT

Late in the afternoon of March 6 the house-boat was ready, and in the tow of the launch came to the wharf for our outfit. Such a strange-looking craft and the first of its kind on Gatun Lake excited considerable interest among the natives and canal employees, who half an hour later saw us depart with Captain Brown, the owner of the launch, at the wheel. Our destination was the Trinidad River, where we were to leave the flooded valley several miles up and enter a *trocha* leading to a new plantation, three miles inside the flooded forests, following the narrow lane that had been cut out by felling the larger timber before the coming of the lake.

Of the thousands of employees about the locks none had ever visited the plantation except our pilot, for this particular region was regarded as a most likely one to get lost in, and of this we were warned by the resident engineer. A heavy but favorable sea was running, and as the waves surged harmlessly along the low deck we wondered what would be the rate of speed or the condition of the boat were we headed into it.

Before dark the interior of the house-boat was put in order, interrupted now and then as the wheelsman took a short cut through the dead timber, when all hands with boat-hooks and oars assisted in keeping clear of the trees and floating logs. It was several hours after sunset and under the light of a half moon that we reached the nearly submerged point indicating the entrance to the valley of the Trinidad.

AN ENTERPRISING CHINAMAN

Here at the base had once been the native village of Escobal, now covered except for several huts on top of the ridge (see page 171), in one of which lived an enterprising Chinaman, who made a poor living selling groceries and a better one dispensing various intoxicants; for he was safely located a few yards beyond the zonal line of Federal prohibition.

By previous arrangement the Chinaman had two native guides for us, and, with these aboard, we quickly departed, in order to reach the plantation before the setting of the moon. Seated within and facing the open side, we were able to watch the course through the tops of the great dead forest, where the deep waters had destroyed or covered over many of the smaller trees.

Running at low speed, we were several hours crossing over, but by a combination of good luck and skill Captain Brown found the entrance of the *trocha* just ahead, unmarked except by the knowledge he had of trees near the mouth. How the house-boat ever got up this narrow and more or less blocked passageway was a mystery, for while running it later, in daylight, with the launch, we often got astray or fouled on snags a foot or two below the surface.

JUNGLES TOO DENSE TO BURN

At midnight, in rounding a turn, there was a barking of dogs and we could see the glowing embers of scattered fires, for in clearing such ground the cut timber is stacked and then burned continuously during the dry season. This unexpected condition I feared would alarm the wild animals of the neighborhood, which, un-

FLOATING LOGS WERE A MASS OF LONG-LEAVED PLANTS AND SLENDER REEDS, SURROUNDED BY BLUE-TINTED AND FRAGRANT WATER HYACINTHS (SEE PAGE 163)

like those of the North, that are so partial to "burnings" and the tender vegetation, were likely to abandon a section unexpectedly covered with smoke and disturbed by crackling flames, since in the dense and humid jungles fires are rare and seldom progress very far, even with the aid of man.

After the house-boat had been tied up to a large tree, a few yards from shore, we were visited by the native superintendent and given a generous welcome. As Captain Brown was anxious to return to Gatun before the morning wind had roughened the lake, he left with Anderson, who was to bring the launch back the next day. Less than a mile away a mass of floating logs was encountered, and the moon now being below the horizon, we were compelled to stop until daylight.

In the morning, as the sun arose, flocks of chattering parrots flew over, and occasionally a pair or two alighted on the higher trees, peering down on the half-screened boat. A shot from the cabin in the clearing, a descending object and a thud proclaimed a doubtful addition to the larder, an oft-repeated occurrence, showing that nothing was spared by the native hunters, for there are no game laws outside the Zone and no effort to preserve even the ornamental birds of the country.

The well-earned outings of the canal employees were too often signalized by making a target of harmless, non-game animals and birds until Colonel Goethals undertook to prevent such thoughtless destruction.

While there is little likelihood of any species living within the jungle becoming extinct, it would require but little effort to make the lake region a wonderful outdoor zoölogical garden that would

prove almost as interesting to visitors as the game refuges along the government railroad in British East Africa.

While breakfasting on the house-boat, a strange, uncouth sound came from the hills to the west, rising and falling in a torrent of guttural notes. It was the first greeting of the "black howler," the largest of the South American monkeys, whose uproarious conduct, whether in tribal conversation, in protestation against man or the weather, was a source of astonishment thereafter. My friend Fuertes, the bird artist and naturalist, whose mimicry of bird notes is quite equal to the fidelity of his brush, declares that the noise of the "howler" is by far the most striking sound in the American tropics, being "a deep, throaty, bass roar, with something of the quality of grunting pigs or of the barking bellow of a bull alligator or an ostrich. The noise was as loud as the full-throated roaring of lions, and its marvelous carrying power was frequently attested when we heard it from the far side of some great Andean valley."

It is a popular belief on the Isthmus that the "black howler" is an infallible weather prophet, and especially so in predicting a shower. So far as we could discover, it was only when the clouds blackened overhead and the first preliminary drops began to fall that this prognosticator considered it safe to commit himself in the forecast.

About 10 o'clock Mr. Anthony, carrying a gun, and his guide a pack of steel traps, left for the only open trail in the neighborhood, leading to an older plantation bordering the lake on the other side of the promontory, while I went in another direction, along a dry creek bottom, to select places for the flashlight and cameras, where the bait was to be the freshly skinned carcass of the trapped specimens, were they accommodating enough to serve this double purpose. And in passing it may be noted that the only natural foot-trails, and that during the dry season, are the creek bottoms, which are cleared of all underbrush and fallen trees by the torrential rains falling during eight months in the year. It is here, too, that many of the wild animals, large and small, seek easy routes of travel, as well as coming for the purpose of quenching their thirst at the small pools and pot-holes scooped out in the soft sandstone formation of all the creeks, while others come to prey upon those exposing themselves to attack.

On returning at noon the trapping party discovered a band of black howlers passing overhead, with a result described in the collector's notebook as follows: "I felt a pang of regret at silencing one of the 'howlers,' but as a specimen was needed I shot the foremost and heard him crash through the limbs to the ground. Pangs of a more effective source were experienced when my native boy and I attempted to retrieve the monkey, for he had fallen through a bee's nest the size of a bushel basket and we found the nest too late to avoid the consequences." Taking a lantern after dark the specimen, a fine large male, was recovered and brought to the house-boat (see page 189).

The following morning the traps only yielded a number of small rodents, while the runways, formerly used by larger game, showed scarcely a track—plain evidence that the heavy smoke from the clearing had driven them away. This compelled long and hard trips into the more distant forests, where trails had to be cut with a machete, foot by foot, resulting in a wonderful collection of ticks and red bugs and little game until the trails had been cleared for a day or two. But it was our experience here and elsewhere that the jungles of Panama are abundantly supplied with a great variety of wild life.

Observing about the house-boat several good-sized fish, a coarse line and a single rusty hook were put in service, with the result of soon landing a dozen averaging a pound or more. These resembled the black mullet and were fairly edible, proving, however, of greater service in baiting the traps and the flashlight machines. Whether they are land-locked fish from the sea, imprisoned on the closing of the locks, or coming from the numerous streams, they have certainly multiplied wonderfully, for we found them everywhere about the lake.

A smaller variety of fish was also no-

FLASHLIGHT PICTURE OF PACA (*Agouti paca virgata*)

One of the largest of the existing rodents, the closely related capybara alone exceeding it in size. The paca is an animal of nocturnal habits, and therefore can be photographed only by means of flashlight apparatus set at night. Note in the animal's mouth the mango, which was used as bait. This is one of the game animals of the natives, who call it *conejo pintado,* or spotted "rabbit." Its eyes glow at night (see page 179).

ticed and they proved a great annoyance when bathing, as they had the habit of nipping a swimmer severely and could only be kept away by a vigorous commotion in the water. In its transient condition this lake should prove of scientific interest to the fish culturist, and presents a possibility of introducing many varieties of fish that would soon become of value commercially or to the visiting sportsmen.

It may be of interest to note that the southern range of the migratory wild fowl does not extend to Panama, for aside from two varieties of ducks—the blue-wing teal and the lesser scaup—no geese, brant, swans, or any of the other numerous varieties of ducks were seen by us or noted by careful resident observers, indicating that the Federal Migratory Bird Law, which has so effectively prohibited spring shooting in the States during the nesting flight, need only be supplemented by a treaty with Canada and Mexico in order to cover the extreme range of these valuable and rapidly vanishing birds. A pending treaty, protecting fish in international waters, involves the same Federal supervision.

TWO WAIFS OF GATUN LAKE

For centuries the valleys now occupied by Gatun Lake had been the home or feeding places of many wild animals, especially the tapir and deer. In the fall of 1911 the rising waters began driving the several species of deer from the bottom lands, where the thickets and more tender vegetation had afforded the best of shelter and of food. Some sought ridges and other near-by elevations, unaware that in a few months these refuges would become isolated as islands or wholly submerged by the rising lake.

ONE OF THE MANY THOUSANDS OF TREES FESTOONED WITH GROUPS OF BRILLIANT ORCHIDS DYING IN GATUN LAKE

About this time Captain Brown made a trip in his launch exploring the new avenues for motor-boats and in a territory where he had hunted for years afoot. In passing some matted drift composed of dead vegetation, which, under the pressure of the wind, had just passed out from a recently flooded island, he noticed lying fast asleep thereon a beautiful little fawn. It was but a few days old and the debris had been its cradle within the flooded timber.

Now separated forever from its mother, in the open lake, and destined to starve, drown, or become the prey of eagles or alligators, it was taken aboard and added to the captain's collection of native animals at Gatun. Raised by hand and under kind treatment, it reached maturity, becoming the favorite pet of the canal village (see page 173).

OUR HOUSE-BOAT ANCHORED OVER THE FLOODED VILLAGE OF ESCOBAL

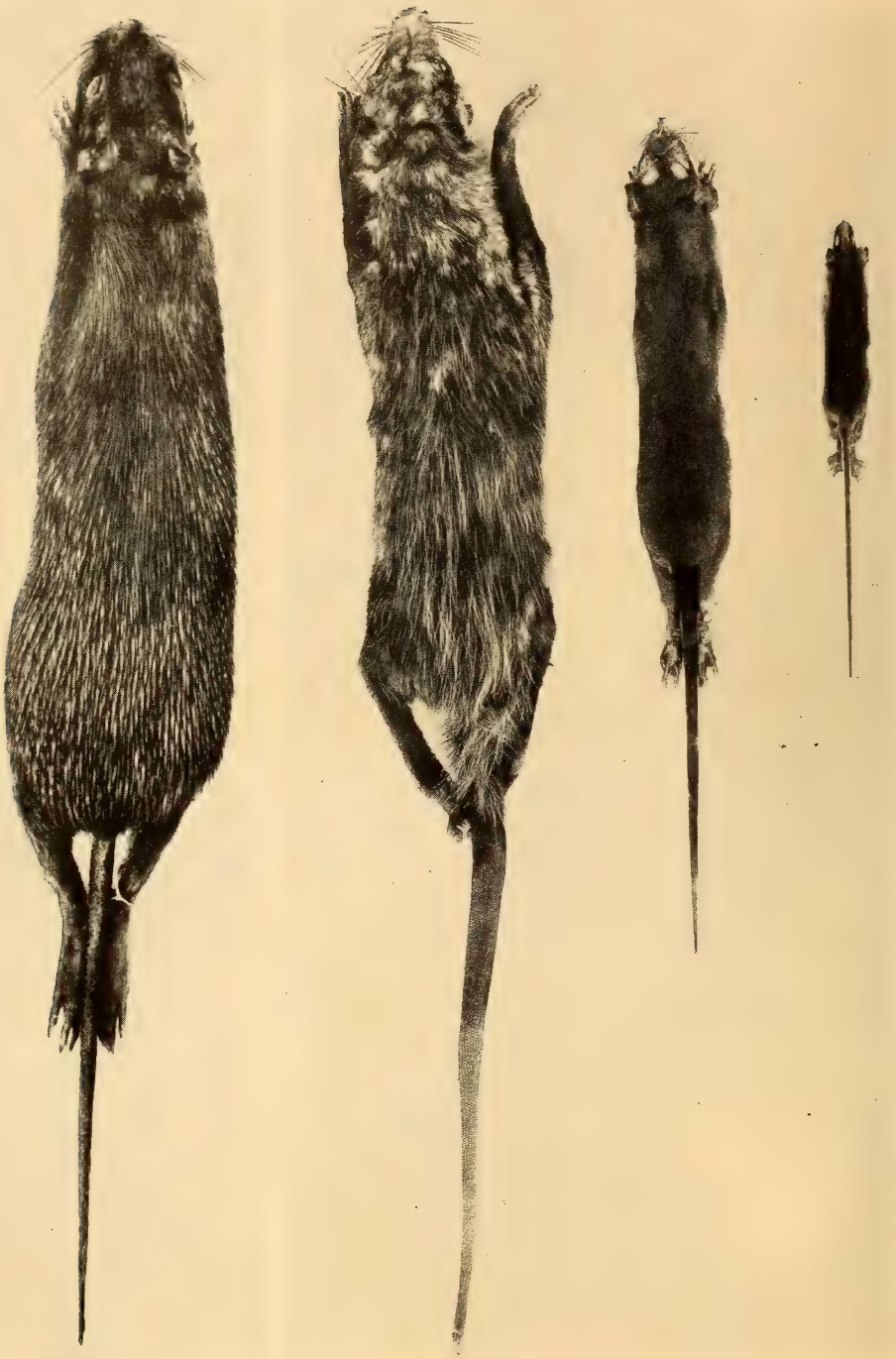
Note the floating islands near shore. These become of great size when permanently anchored by snags and dead trees.

A STARVING OWL MONKEY

A few months later, upon another expedition in the same region, a good lookout was kept for other marooned animals. Finally, in a large tree surrounded by water and a considerable distance from dry land, a round furry object was noticed in an upper crotch. As the launch approached, the ball unrolled into a small monkey-like creature, but with the bulging eyes of a lemur which Captain Brown felt sure was a rarely seen nocturnal species known as the owl monkey.

As this would prove a rare find, besides once more saving another animal in distress, the launch was tied to the tree and an effort made to slip a noose over its head by means of a boat-hook; but this proved unsuccessful. Then a ripe banana was placed invitingly on the bow, and Captain Brown retired to the stern to await results. In a very few minutes the little animal came down the tree, leaped on deck, and began eagerly devouring the fruit. It was evidently on the verge of starvation and permitted the rope to be cast off without showing any desire to seek its former retreat. An hour later the little monkey was placed in the same pen with the fawn and fed, when it sought a shelf on the rear porch, where it was concealed during the daytime by boxes and coils of rope.

True to its nature, it was never seen in the daytime, except when purposely disturbed, but after dark became continuously active (see page 175). On chilly nights it would seek the sleeping fawn



RATS AND OPOSSUMS CAUGHT ON GATUN LAKE

(A) Spiny rat; the quill-like hairs on back are probably used for defensive purposes. (B) Big gray opossum; this is the largest species found in Panama, variable in colors; the average number of young found with parent was seven. (C) Rat-tailed opossum, a medium-sized species. (D) Murine opossum, a very small species, the size of a ground squirrel.

A BROCKET DEER: RESCUED FROM A FLOATING ISLAND WHEN A FAWN (SEE P. 171)

and curl up on its back for warmth. My later introduction to this interesting animal is referred to again when testing its eyes under an artificial light to see whether they would shine.

SHOOTING A BOA-CONSTRICTOR

The dispersal or isolation of wild life had mostly occurred before our arrival. Some of the best specimens of the larger animals were obtained, through the assistance of hounds, on several of the islands where the deer and peccaries were still abundant, but more or less preyed upon by jaguars and ocelot. One afternoon when cruising through a forest of gaunt, dead trees, and where the water was fully 20 feet deep, we were surprised to see a large boa-constrictor sunning itself on a limb not much above the surface.

Regarding it as a good museum specimen, a rifle ball pierced the body just back of the head, and with a convulsive movement the snake hurled itself toward the bow of the launch, from which it unfortunately slid into the water, leaving only a crimson circle and a string of bubbles on its way to the bottom, where it could not be recovered. Whether it sought out a dead tree in the open water as the only available basking place in this deluged district or had found some form of prey unknown to us was hard to determine

DIFFICULTIES OF NIGHT PHOTOGRAPHY IN THE TROPICS

While I had been previously successful in flashlight photography in southern climes like Mexico and the West Indies, this method in Panama proved difficult. Previous experiences had led me to expect frequent annoying visits from the omnivorous opossum, but here the country was alive with them after dark, ranging from the size of the northern species down to those no larger than a small squirrel (see page 187). No sooner was it dark than I could hear the reports from the scattered flashlight machines, with always a probability of their having been

FLASHLIGHT OF TWO NOCTURNAL RAILS THAT USED THE DRY CREEK BOTTOM WHERE THE FLASH WAS SET

Like the opossums, they fired it repeatedly, pulling on the string whether baited with fruit or meat

fired by a marsupial. In several instances the flash was sprung by a species of night rail, other times by large rats or flying bats (see page 176), and not infrequently by decaying vegetation dropping from the forest tops.

In the daytime the ever-present buzzard soon associated the green tin boxes covering the cameras with a near-by feast and it became necessary to set the flash just at dusk whenever meat bait was used (see page 177).

But worst of all was the extreme humidity, so that plates left exposed in the camera for more than two nights and developed at irregular periods became so mildewed as to be worthless.

A PANIC-STRICKEN JAGUAR

In one instance the flash fired by a jaguar, at a considerable distance from the house-boat, was visited too late to save the plate, and all I had for the effort was the sight of the clawed bank caused by the big animal as it sprang away in terror when the dazzling, booming flash greeted an effort to carry off the skinned body of an opossum, while the same result occurred in the case of a tapir passing along a runway to the water.

Moisture-absorbing chemicals in the camera would have overcome this, but none were at hand when most needed. Undoubtedly flashlight photography is the ideal way of getting pictures of the larger-sized South American animals, where, aside from their being almost wholly nocturnal, the dense brush prevents any possibility of daylight pictures unless such animals can be cornered or treed by the use of hounds.

That the jaguar occasionally hunts in the daytime was shown when Mr. Anthony, shortly after leaving the house-boat, had a big boar peccary nearly knock him over as he was standing scanning the tree-tops for a shot at a squirrel. He fired at it with small shot, rolling it over

dead a few feet away, at the instant his Indian guide, by his elbow, gave a cry of terror, when a big jaguar raised up and roared in his face—so intent had this beast been in following the peccary's trail. But it sprang away in a line with the guide, so a shot could not be safely fired.

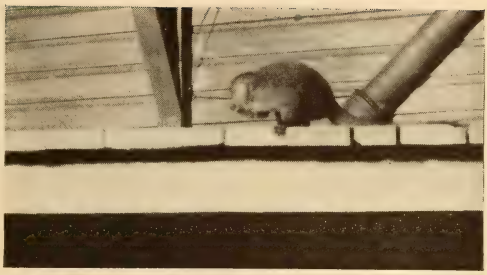
However, this adventure provided us with fresh meat and a good museum specimen (see page 178). That night Anderson, whose bed was on the floor between our cots, became restless, the usual indication that the daily supply of ticks had not been removed before retiring; but when he held up several objects and wanted to know if they were young turtles, his knowledge of entomology was enlarged on being told that they were a very large species of tick from the peccary he had skinned on the floor of the boat some hours before.

BAT CAVES

Many years ago large limestone caves were discovered near the upper Chagres and in these lived numerous bats, ranging in size from a small species to the huge so-called vampire, with a wing-spread exceeding two feet (see page 185). Formerly it was impossible to visit this vicinity other than by an uncertain trail through the ever-intruding jungle; but as the main stream and tributaries deepened with the back waters from the lake, the caves could be reached in a few hours by launch. Under the guidance of a former canal employee, an erstwhile trapper and market hunter, we made a trip on March 1.

After going up the broad, inundated valley of the Chagres some miles, we entered a branch called the Chilibrillo—narrow, deep, and tortuous, with no perceptible current. As the boat glided smoothly in the straight courses and swerved violently at numerous turns, the overhanging shrubbery and the flooded palm trees marking the bed of a stream formerly unnavigable for any kind of craft, we realized more fully how the new lake had opened up these canal-like avenues of travel into the very heart of the jungle (see page 183).

After a run of five or six miles a current became noticeable, and in a few minutes we came to a transverse ledge of rock with a slight flow of water rippling



FLASHLIGHT OF A NOCTURNAL MONKEY RESCUED FROM A FLOODED FOREST (SEE PAGE 171)

over it, indicating the end of the trip by boat. While walking up the nearly dry bed of the stream, it was plain that many animals had sought the higher ground as a refuge, for trails to the scattered pools came in all directions, bearing the fresh imprint of tapir, deer, peccary, agouti, and the occasional claw-marks of the jaguar and ocelot, while the frequent roaring of the black howler showed this big tenant of the tree-tops was also abundant. The grotesque toucans vied with the noisy parrots, while the calling of the parrakeets and the peculiar chorus-like calls of the chachalaca produced an impression that must ever be associated with jungle memories. Turning to the right and going up a creek bottom, we soon came in sight of the low entrance to the caves, encircled with ferns, vines, and flowering plants (see page 184).

Lighting the lantern and stooping low, we entered a corridor leading to a series of interconnecting rooms with high ceilings and dark and grimy walls, relieved here and there by light-colored stalactites, the tapering ends dripping with limestone waters. In the central room, both on the walls and ceiling, were great clusters of bats segregated by species and, as later examination showed, according to sex.

A ZEALOUS GUIDE

One big bunch, some 10 feet square and containing hundreds of small bats, was found on an end wall only 6 feet from the ground and particularly well situated for a flashlight picture. Our local guide, filled with the enthusiasm of the occasion, unbuckled his leather belt, and before his action was anticipated began lashing them, so that in a moment

A SPINY-HAIRED RAT FIRES THE FLASH

a surplus of specimens lay at his feet, while the rest took wing and in bewilderment circled about the lantern.

Our next effort was directed toward getting specimens of the larger bats, which hung from the highest domes, and could only be obtained by throwing missiles at them (see page 185). While picking up some loose pieces of rock for this purpose, we were startled by a quick flash and the reverberating report of a heavy rifle discharged by the guide in another misdirected effort to aid us. A few mangled and useless bodies fell, and then a black stream circled noiselessly overhead, creating a perceptible current of air as they passed continuously back and forth through the connecting caverns. Finally they attached themselves to the roof and a sufficient number were obtained for our purpose, and then a series of flashlight pictures were taken, several of which are shown on pages 184 and 185.

Upon the large detached rocks were dozens of big black beetles, either nocturnal in their habits or accustomed to feed on the vermin or excrement of the bats. A careful examination of these caves indicated that they did not belong to the group formerly discovered by visiting Americans, and as they contain a vast deposit of bat guano and are near water transportation this supply may become of considerable value as a fertilizer.

EYES THAT SHINE AT NIGHT

One of the most effective means in night hunting is the use of a lantern that will cause the eyes of wild animals to shine.

But what has appeared strange is the lack of any general understanding of this interesting phenomenon. In ancient and modern writings, scientific and otherwise, the glowing eyes of animals at night have been a matter of frequent comment, and often as not inaccurate or

misleading. Many have thought, and the impression still prevails, that this light is of a phosphorescent character, while others seem to think that the glow is inherent, so that the eyes of the animals possessing it will shine after dark or in an unlighted room at night regardless of any independent source of light.

Both of these views are, of course, wholly erroneous, since the illumination seen in such eyes is merely the reflection of rays generated beyond the animal and visible to the observer by reflex action. Two disks of tin, the size of a five-cent piece, fastened a few inches apart on the trunk of a tree will so reflect the light from a hunter's lantern as to deceive all but the most expert, and the writer has frequently used this method for detecting or misleading market hunters and others shooting at night in violation of law, for this destructive method is now prohibited in nearly all the States.

At the present time, however, "jacking," as it is usually called, has come into effective use in collecting scientific specimens or as an aid in the taking of flashlight pictures of wild life at night. Since most animals, big and little, are nocturnal, by using a light that will cause their eyes to glow it is now possible to get many specimens or photographs otherwise difficult to obtain and at the same time to use the night hours for this work, thus greatly increasing the opportunities and affording more favorable conditions for photography.

Originally, when hunting and later in night photography, the writer became familiar with many animals whose eyes glowed before a light as well as with those that did not have this peculiarity. For a long time it did not suggest any extended investigation, and beyond noting the different species, their actions under the light, and the variance in color reflection, nothing was done toward determining the portion of the eye that caused such reflection, whether it performed any function or was merely an arbitrary or useless attribute, without value or significance in the classification of different families and species of animals.

BUZZARD FIRING FLASHLIGHT IN DAYTIME

The left wing became involved in string tied to bait and half of the pinion feathers were pulled out. These birds became such a nuisance that when meat bait was used the flash was not set until dusk.

WHY ANIMALS CAN SEE AT NIGHT

In considering eye reflections, they should not be confused with the glistening surface so characteristic of all eyes, human or otherwise. The exterior light is mirrored on a posterior, lustrous layer of the retina, next to the choroid coat, called the *Tapetum lucidum,* and appears as a bright, luminous glow, which, in the case of many large animals, can be seen on a dark night, with a powerful lantern, 100 yards or more away. Such glowing orbs have usually the brightness and steadiness of a star or a ball of fire, and can generally be detected long before the body of the animal becomes visible under the approaching light.

While it is impossible to give here in detail the writer's investigations, they may be summarized by stating that the eyes of all the carnivorous or predacious animals glow, as is the case with their domestic descendants, the cat and dog. The same is true of practically all the hoofed or grazing animals and many other families, while on the other hand the two great orders—the Primates, including man, apes, monkeys, etc., and the Rodents—have few species that possess the *tapetum.* In addition to the mam-

A BOAR PECCARY, SHOT WHEN FLEEING BEFORE A JAGUAR: GATUN LAKE
(SEE PAGE 175)

mals, there are other vertebrates, including certain nocturnal birds, reptiles, and fish, that have brilliant eyes at night, as is the case with some of the invertebrates, such as spiders, beetles, and crabs.

Unquestionably the function of the *tapetum* is to give increased keenness to the night vision, for in no instance do strictly diurnal creatures have reflecting eyes, while practically all those of nocturnal habits possess this element of the eye.

On the Panama trip considerable study was given this subject, for there were missing links that only the tropics could supply. Up to this time I had not found a single member of the Primates that had reflecting eyes, for all tested were diurnal, like man. In several countries there are species of nocturnal monkeys, but I could never find one in the zoölogical collections, and therefore it was with great interest that I tested the eyes of the little owl monkey, whose rescue from a flooded forest is mentioned elsewhere.

Selecting a dark night and turning the lantern toward it as it sat on the upper edge of a porch, its eyes glistened like two brilliant diamonds.

Later, on taking a flashlight picture of

it, it became so wild on my approach as to prevent any further study; but as this particular monkey has not a prehensile tail and the eyes and general features resemble the lemur, a strictly nocturnal animal, it is probable that it represents a connecting link between the monkeys and the lemurs.

A HUNTER FOOLED

In the North I had found that the eyes of one species of night-hawk, belonging to the goatsucker family, would shine brightly under the light. While at Gatun I at once noticed that the night-hawks circling about the electric lights after insects had very brilliant eyes, and on one occasion, when Mr. Anthony was in the forest "headlighting" for specimens of the cat family, he saw a large pair of brilliant red eyes glowing from the top of a tree, and he fired with the expectation of getting an ocelot, or a similar animal. Instead of a heavy body crashing through the branches there was a slight swish, and in going under the tree he found that he had killed a large goatsucker, the biggest of the night-hawk family; and while he was disappointed, the result of the shot showed that all the members of these nocturnal birds possess a *tapetum*.

On other occasions we found that the larger species of the southern Rodents, like the agouti and paca, could be easily shined at night, and since the northern Rodents, with the exception of the rabbit (which at best can be doubtfully classified as such), do not have shining eyes, it is possible that this physical element may be used as a basis for creating a suborder of Rodents.

On the upper Chagres we found that there was one species of fish which apparently fed mostly at night, and under the light its eyes would glow with the same brilliant red possessed by the alligator, another night feeder. While the results in Panama enlarged the number of species having reflecting eyes, they confirmed more than ever the writer's position, that the possession of the *tapetum* is directly associated with night vision, while the brilliancy of such reflection, it has been found, corresponds to the animal's need of such a faculty in defense or aggression.

NO PERIODICITY IN HABITS AS IN THE NORTH

The animal I felt a particular interest in on this trip was the Central American whitetail, a relative of the Virginia deer.

This species and its geographic representatives are found in all the lower Canadian provinces, in practically all our States and ranges southerly through Mexico, Central America to the Andes, and down into Brazil and Peru. The whitetails are now, as in the past, the most abundant and widely distributed of all the groups of our native deer, and as far as northern Mexico are represented by several closely related forms, beyond which they break into a number of distinct species.

The northerly mating season covers a period of about 30 days each fall; the bucks commence shedding their horns a month or so afterward, while the fawns are born in the late spring and within a corresponding period of 30 days. Such periodic and seasonable habits are undoubtedly caused and controlled by the rigorous winters and lack of nourishing food during the portion of the year when any newly born offspring would suffer or perish. Even in the Gulf States the mating and breeding seasons correspond closely with those of higher latitudes, due largely to the northern origin of the species—with the consequent inherited tendencies—and also because, even in the most southerly States, the colder winds affect many tender varieties of vegetation.

After passing the Mexican border, and especially from Vera Cruz south, there is a considerable enlargement of the breeding season, since necessity no longer controls the habits.

A VARIABLE BREEDING SEASON

On the Isthmus of Panama, with a mean annual temperature of 80 degrees, there is only an average difference of five degrees between the so-called summer and winter months, with the result that the rut, the shedding of the horns, and the birth of the young are very irregular. On the Isthmus the fawns are born dur-

MAP OF THE ISTHMUS OF PANAMA BEFORE THE ESTABLISHMENT OF THE CANAL ZONE

Showing former route of Panama Railroad, the various watercourses, and the valley basins later occupied by Gatun Lake, with the location of the larger native villages therein.

MAP OF THE CANAL ZONE AND SURROUNDING TERRITORY OF THE PANAMA REPUBLIC

Showing the relocated railroad, the canal route, Gatun Lake, covering 164 square miles, and the portion of same extending beyond the zone, with the watershed and tributary streams still under the exclusive jurisdiction of Panama. One-third of the lake and all the flooded valleys contain much standing timber, living and dead (see pages 187, 188, and 191).

ing a period of nine months, while a hornless buck may be found any month or again bearing antlers in various stages of growth.

And it is an interesting and undetermined question whether the prolonged breeding season does not result in many bucks carrying their horns much beyond the normal period in the North. If, as the writer believes, the horn growth of the male is purely a sexual manifestation, and incidentally providing a means to battle with the numerous rivals, and are shed in the North long before they can be of use against wolves and other predatory animals, then, with the Panama deer mating throughout most of the year, it may result in the carrying of the fully developed horns much longer than usual. With the tapir and many other large animals the prolonged breeding season was noticeable, but to a lesser extent among the birds.

UNITED STATES OWNERSHIP OF LAKE SITE NECESSARY

Conceding that Gatun Lake is the most essential factor in the canal system, it is evident that the entire basin and the surrounding shores should be under the exclusive sovereignty of the United States, while the main watersheds should also be under some form of supervision. A canal zone 10 miles wide may have seemed in the beginning a sufficiently large tract to be taken out of so small a republic as that of Panama, just as the constitutional restrictions on the size of the District of Columbia seemed reasonable at the time.

When it is finally appreciated that more than one-third of the superficial area of Gatun Lake and practically all the watersheds upon which the maintenance and the purity of the lake depend are within the sovereignty of another nation, seriously interfering with our control from a commercial, engineering, sanitary, and military standpoint, the present limitations appear unfortunate. While the consideration of this feature of Isthmian geography may not be germane to the original purposes of our exploration, yet no one can spend weeks traversing the proportionately large sheets of water lying beyond the zone without being impressed with the lack of governmental control.

Any enlargement of our territory under the existing treaty with Panama, which, fortunately, covers future readjustment of our holdings, should be undertaken at the earliest possible time, for with the springing up of many native villages about or near the shores of the lake, the costly preparation of land for agricultural purposes, the use of the waters as a convenient medium for travel and shipments, any interference therewith a few years from now will be at the expense of vested rights, making the condemnation more costly and, what is more to be feared, causing endless friction with the Panamanians, who will resent their dispossession after enjoying the many benefits of the inland waterways, regardless of how such occupation may interfere with the purposes for which the lake was created.

SETTLEMENT ENCOURAGED

Already both whites and natives are buying up or taking possession of large tracts of riparian lands just outside the boundary and along the now navigable valleys, in easy communication with all parts of the zone by boat or rail. Colonization schemes are in the bud and regarded with a somewhat favorable eye by our government, for we are told in official communications, in lectures, and by illustrated articles the wonderful future of the zone and adjacent lands for the enterprising agriculturists from the States.

On the Pacific slope, where there is no connection with or drainage into Gatun Lake, and again in the great forested tracts along the Atlantic coast, there are doubtless many opportunities for fruit-growers, stock-raisers, or lumbermen; but on all lands bordering or draining into the lake every effort should be made to prevent or restrict permanent settlements or any other occupation materially interfering with the control and protection of the lake waters.

Engineering Reasons.—The duty of watching and measuring the precipitation during periods of excessive rainfall

SCENE ON THE RIO CHILIBRILLO, UP WHICH TRIPS WERE MADE TO VISIT THE BAT CAVES

As palms never grow in water, something of the extent of the flooding of this region can be judged

on the watersheds is important, in order to properly safeguard any part of the lake basin subject to overflow or unusual pressure. Some miles up one of the valley estuaries is a ridge called "the Cana Saddle," forming a natural embankment between the impounded waters and the Caribbean Sea. So low is this rim, when the lake reaches the prescribed maximum of 87 feet, that a prolonged freshet might overflow the bank or a heavy, continuous pressure start a leakage, with the result, in either case, of the rushing waters cutting down or bursting through the embankment, reducing the lake level below the minimum required for navigation.

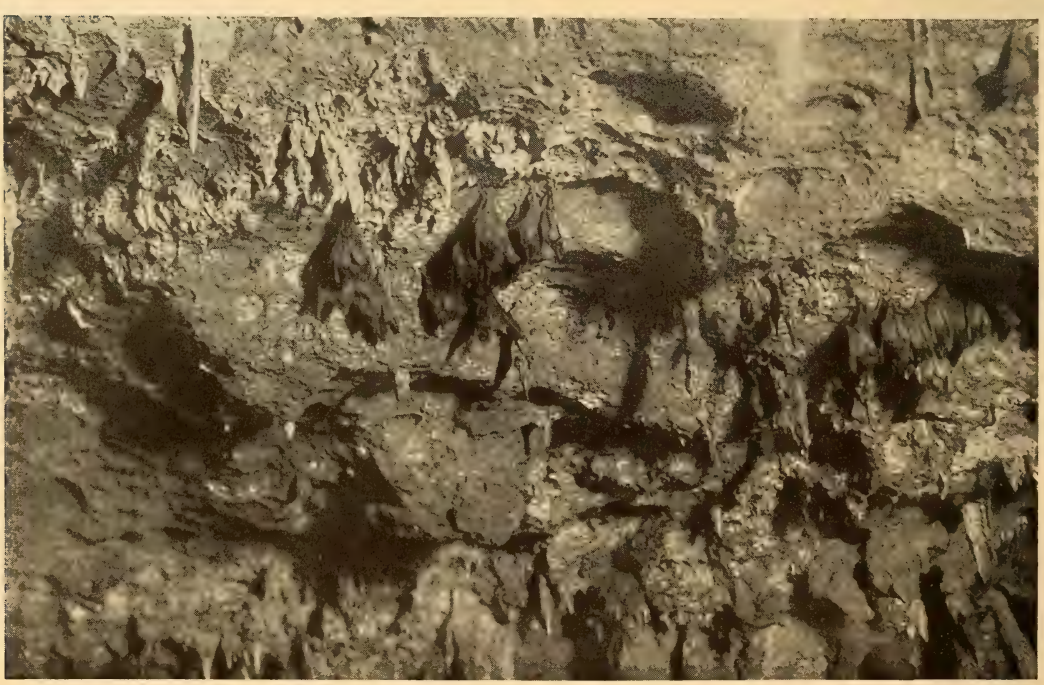
Were this break to occur just before the dry season, it might easily interrupt commerce for months, since the required depth could not be restored until well into the wet season. One or two other localities, also outside the zone, present somewhat similar features. Such an interruption would be a universal calamity in times of peace and probably more serious for us in times of war.

IS THE CANAL IMPREGNABLE?

Military Reasons.—Our refusal to accept the proposal of European nations for an unfortified or neutralized canal, followed by erecting the heaviest possible armament on the seaboard, becomes ludicrous if the operation of the canal can be suspended for months by the use of a stick of dynamite on a northern arm of the lake or through the destruction of the Pedro Miguel locks at the south by projectiles fired from the slopes of the Chagres River, since such easily concealed assaults would originate beyond our interior borders.

To protect the entrances of the canal by fortifications and war vessels, while

THE LOW ENTRANCE TO THE BAT CAVE ON THE CHILIBRILLO RIVER OPENS INTO A SERIES OF LONG CORRIDORS AND CHAMBERS MORE OR LESS INTERCOMMUNICATING



FLASHLIGHT OF A SMALL CLUSTER OF BATS BEFORE THEY WERE ALARMED

Clusters are ordinarily formed of a great number of individuals, probably several hundred in some instances. The variety shown is one of the largest of South American bats, one specimen secured having a wing expanse of 26 inches. The bats are strong and muscular and always ready to bite. The masses of bats bear a close resemblance in form to the stalactites with which the walls and domed ceilings are covered.

FLASHLIGHT PHOTOGRAPH OF SMALL BATS

They were isolated by species and sexes, each species confined to a particular grotto, where it was found in hundreds. and the bats of each mass all of the same sex

A FALSE OR SO-CALLED VAMPIRE BAT, WITH A WING-SPREAD OF 2 FEET 2 INCHES

Lives mostly on fruits. One of specimens from the bat caves

IN A BAT CAVE

Showing our method of photographing bats by flashlight. As the flashlight powder used is exceedingly explosive, the expression on the face of the operator is not to be wondered at

trusting to the supposedly enduring friendship of Panama or the inviolability of its neutrality by other nations, is much like locking the front and back doors while leaving those on the side invitingly open.

Although reference to military weakness is not always subject to a frank and full discussion, yet the perils suggested are apparent to the casual observer and beyond concealment. If this great reservoir can be broken and drained outside our possessions, the terminal locks left in easy range of guns beyond the border, or raiding boats concealed on lake waters beyond the zone, it will be entirely the result of not possessing territory esssential to the military protection of the canal.

Sanitary Reasons.—It will be unnecessary to recall or describe the terrible loss of life suffered by the French in the effort to construct the canal or the proportionately greater loss in building the Panama Railroad many years preceding. All the conditions entering into such epidemics were understood by our sanitary authorities when the more active work was begun, and the methods and regulations prepared by Colonel Gorgas resulted in maintaining throughout the entire period of construction a lower mortality rate than in many of the States.

Having found that the principal scourges of the Isthmus—yellow fever and malaria—were spread by two indigenous forms of infected mosquitoes, efforts were directed toward destroying the breeding places of such in the neighborhood of construction towns or wherever workmen were exposed, by draining the swamps or spraying the stagnant waters with crude oil, while all dwellings

FLASHLIGHT PHOTOGRAPH OF ONE OF SEVERAL VARIETIES OF OPOSSUMS ENCOUNTERED IN THE CANAL ZONE

The particular opossum shown is the commonest species, and by reason of its abundance and its omnivorous appetite it proved a serious obstacle to flashlight photography. Probably 75 per cent of the flashes fired were sprung by opossums, who found and fired the camera shortly after dusk, before better game was moving.

were carefully screened and inspected and the employees supplied gratuitously with quinine. By isolating, in conveniently located hospitals, all suspected or infected cases there was no possible chance for an epidemic to get a foothold.

LOSING SANITARY CONTROL

Now that most of the government towns about the lake have been dismantled or occupied only by a few permanent employees, it should be easier to insure proper health conditions along the canal route were it not for several changes which if ignored may cause a reversion to the old conditions or worse.

The change that has taken place since the lake filled up the lower Chagres Valley and extended far inland, flooding temporarily, and at places permanently, lowlands far beyond the zone, has already been mentioned. Taking the lake as a whole, and after the stagnation caused by decaying vegetation has ceased, it ought to be sufficiently pure for many domestic uses. Probably 90 per cent of the supply is the quickly delivered torrential rains, and the remainder, mostly during the dry season, is the contribution of small streams fed by the stored waters of the limestone formations; so its purity nearly equals that of distilled water.

With a depth in the main part surpassing that of Lake Erie, the surface roughened and aërated by daily winds and the rotting vegetation replaced by aquatic growths favorable to purification, there is no apparent reason why such water should not be piped, as now contemplated, to the cities of Panama and Colon or the neighboring towns, as well as becoming an important source of supply for the numerous ships en route between distant ports.

FLASHLIGHT OF A PIG-LIKE CREATURE: THE LONG, NAKED TAIL, HOWEVER, SHOWS IT TO BE A SPECIES OF PANAMA OPOSSUM

Therefore any infected drainage carrying typhoid, tuberculosis, and other water-borne diseases, productive of fevers or intestinal disorders, should be rigorously controlled. Yet this is impossible if scattered habitations and native villages occupy any considerable portion of the amphitheater of hills about the lake basin.

DANGEROUS TO SHIPPING

More serious, however, than the impairment of this great body of water for domestic uses will be the ever-increasing influx of mosquitoes, heretofore suppressed by the activity of the health authorities. The difference between draining or spraying local swamps and stagnant pools along an unfilled canal, with the easy enforcement of health regulations among the employees, and that of effectively controlling the inception and spread of mosquitoes in the more than 160 square miles of tepid waters, surrounded by ignorant and uncontrollable natives, is too apparent for argument.

While the deeper waters and those in which small fish have ready access may not be any great source of trouble, yet the myriad of swamps and pools, the thousands of water-holes in shore depressions or creek bottoms, will afford a breeding place, and the jungle a refuge, for an army of yellow fever and malarial mosquitoes. Imagine what will follow the relocation of native villages in the neighborhood of these shallow and sheltered waters.

Wherever we went about the shores mosquitoes were fairly abundant in the daytime and very numerous at dusk or thereafter. On the several occasions that we boarded a train in the evening at smaller stations adjacent to the lake we noticed the great abundance of mosquitoes, and especially that of the *anopheles* variety—the carrier of malaria.

These back-woods stations seem to be the gathering place in the evening of all the neighboring population, and as the cars are unscreened and the windows continuously open, it is easy to see how, in case an epidemic starts at such points, infected mosquitoes will be quickly and continuously conveyed to the large cities at either end of the route. Under such conditions, too, the slow passage of steamships by the swampy shores of the lake at all hours of the day and night will invite

The black howler, the largest of the Panaman monkeys, is looked upon by the natives as a weather prophet, its loud, long, and reverberating howl being most frequently heard just preceding a heavy rain (see page 168).

MARMOSET MONKEY, WITH HAIR LIKE SILK, IN SHADES OF BROWN AND GRAY

A beautiful and attractive pet. There are five species of monkeys in the zone, from the black howler, the size of a small ape, down to the little squirrel monkey

ANOTHER OPOSSUM FINDS THE BAIT

A CREEK BOTTOM ARBORED OVER WITH GIANT FERNS AND SWAYING VINES, WHERE THE FLASHLIGHT WAS FIRED BY A JAGUAR: CAMERA OUTFIT MARKED X

A GATUN LAKE IGUANA, THE GIANT LIZARD OF THE SOUTH, MUCH PRIZED BY NATIVES FOR FOOD

the contraction of such contagious diseases, threatening all the great ports of the world and resulting in a quarantine that might disrupt commercial intercourse for months.

A CASE IN POINT

Our experiences in this respect were suggestive. At no time in Gatun or other government towns were mosquitoes noticeable, since thickets had been cleared, the swamps drained or sprayed, and every precaution taken against the presence of insect life or their intrusion into dwellings. When the house-boat was anchored in the lagoons it was equally well protected against mosquitoes, besides we had little fear of fever when not near native villages.

But at the plantation on the Trocha were half a dozen laborers, and we were frequently bitten by malarial mosquitoes when coming through the clearing at dusk or when taking a refreshing bath off the boat after a hot day's work. All three of us developed malaria on or after leaving the Isthmus, and as we learned later that the white manager of the plantation had been taken to the Gatun Hospital, a week before our arrival, suffering from a severe case of fever, it seems quite certain that we were only an additional link in the chain of dissemination.

ENLARGE THE LAKE ZONE

In a communication recently received from a former canal commissioner, who was in charge at the time the Hay-Varilla Treaty was being negotiated, he wrote:

"What you say of the dangers arising from the lack of control by the United States to the lands adjoining the margin of Lake Gatun and outside the Canal Zone is not exaggerated. When the width of the zone was fixed at 10 miles, from ocean to ocean, the plans did not contemplate the construction of the dam at Gatun, but at Bohio, and the resulting lake would have been much smaller had that plan been carried out. The necessity has become greater as the area of the lake has become greater. . . .

"Until we have a lesson of experience in one or more elements of danger, I fear that opposition will develop more strength than can be overcome. So far as the

HERON FISHING AT HEAD-WATER STREAM: AS THE SHORES OF THE LAKE OPEN UP THEY WILL BE A FAVORITE RESORT FOR ALL WADING BIRDS

powers under the treaty are concerned, they are ample to enable us to acquire all the lands needed."

The treaty in question was proclaimed by President Roosevelt, February 26, 1904, and contained several broad stipulations altogether sufficient to meet present requirements. Article II, after granting, under definite boundaries, the 10-mile zone, further provides that the United States shall be granted "in perpetuity the use, occupation, and control of any other lands and waters outside of the zone, above described, which may be necessary and convenient for the construction, maintenance, operation, sanitation, and protection of the said canal."

TIME MUST BE FIXED

The acceptance of this privilege is not operative, of course, without proof that such enlargement is "necessary and convenient" in the use and protection of the canal. A demand, therefore, must be made for a compliance with this agreement. However liberal this offer, no independent nation can yield or another accept sovereignty over a territory without a proper definement of the ceded land, in order to determine the date of transfer and the permanent assumption of a jurisdiction thereover.

Eleven years have now elapsed since the treaty went into effect, and good faith as well as expediency suggests negotiations for determining the amount of land or adjacent waters needed to protect the United States in its use of the canal. While the treaty is silent as to additional compensation, such an omission should be disregarded and an appropriation made in proportion to the value of the additional grant.

All or a part of this sum might be used by Panama in the purchase of the boundary territory from Costa Rica, now under dispute, thereby restoring to Panama an area that would serve as an equivalent for the cession of the additional land, and at the same time bringing the three nations concerned into a mutual adjustment of their territorial rights.

THE RISING LAKE COVERED MANY NATIVE VILLAGES

Inhabitants in the remote valleys had no faith in the predicted rise and neglected to remove their property in time

A ZOÖLOGICAL AND BOTANICAL PARK

While the various so-called insular possessions of the United States present many strange forms of plant and animal life, most of these are beyond the current of our domestic intercourse and are little visited by travelers from other lands. Wonderful as are our national parks, they must be seen, if at all, by those diverted from the customary lines of travel.

The Canal Zone, however, is seen en route, and is the only Federal domain of surpassing interest that can be directly traversed by boat or rail and in which each citizen having a feeling of proprietorship should favor its permanent improvement and beautification. The terminal cities of the canal—Colon and Panama—will continue to be objects of interest; but how refreshing and entertaining is the trans-Isthmian trip, for here can be seen the tropic growths in all their luxuriance, and here ought to be visible every native variety of tree, shrub, and bloom, the wonderful bird life, the strange species of mammals and reptiles, and all that goes toward making a panoramic summary of tropical life.

The lake district, as the center of this great international park, would soon become the natural home of the deer, peccaries, tapirs, monkeys, alligators, crocodiles, and iguanas; a resort for every variety of fresh-water fish known to the southern continent; the place to colonize vast rookeries of heron and egrets, while protection against the gun would soon make the routes of travel resound with the noisy chatter of parrots and macaws, and myriads of bright-colored songsters would give added color to the orchid-laden trees.

A LESSON FOR OTHERS

What an example in wild-life conservation to our sister republics of the South! Such self-restraint in useless or wasteful destruction would soon bring to the car windows and to the edge of each hamlet a varied and interesting life now hidden to most eyes in the impenetrable jungles. The introduction of many beautiful and useful plants from South America could be supplemented by those from Africa and similar climes, and not out of line with such a display, as already suggested by Colonel Roosevelt, would be

HOUSE-BOAT TIED TO DEAD TREE MANY MILES FROM DRY LAND

The open space gave sunlight, cooling breezes, and freedom from insects, and the deep, clear water invited the morning and evening swim. Fish of several species were very numerous.

the naturalization of strange foreign animals like the hippopotamus, the waterbuck, and numerous other interesting or valuable animals suited to these surroundings.

Shooting, under a Federal license, of predaceous animals like the jaguar, puma, and ocelot could be permitted, while up the now navigable valleys leading into the Panaman wilderness hunting parties would enjoy a variety of sport with the minimum of discomfort or loss of time. Many of the wildest districts, unsurpassed in all of South America, can be reached from our northerly cities in less time than it now takes to visit the remoter portions of the Rocky Mountains or hunting resorts in upper Canada.

At a trifling cost a resident superintendent of zoölogy and botany could be maintained, with all the benefits following the scientific study of plant and animal life of our only continental possession in the Southern Hemisphere; and here would come the representatives from our great museums and other scientific organizations, were it possible for them to receive the coöperation of trained resident experts, thus avoiding the delay and wasted efforts such as were suffered by the present expedition, where half the time was occupied in outfitting and acquiring reliable information.

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THE WARFARE ON OUR EASTERN COAST

By John Oliver La Gorce

WE ARE prone to marvel at the wonderful changes that geologic ages have wrought upon the face of mother earth; it seems almost unreal that there could have come about transformations great enough to convert the polar regions from a wilderness of vegetation into a land of perpetual ice and snow, changes vast enough to bring the tops of mountains to the bottom of the sea and the bottom of the sea to the tops of the mountains. Moreover, to the casual observer in this work-a-day world, it seems a wild dream of fancy to think that the clock of geologic time is still running and registering these same processes hour by hour.

A WAR OF ETERNITY

Yet it is true; and in some places it runs so fast that we may, as it were, see the minute hand moving upon the dial. One of the most conspicuous places by which to illustrate this remarkable condition is the coast line of the southeastern United States from the Virginia Capes to the Rio Grande. Here, as along every other coast-line on the face of the earth, there is perpetual warfare between the land and the sea, with the wind as a shifting ally, now throwing its weight into the balance on the one side and now on the other. Here the land is taking the offensive, driving the sea back foot by foot, always with the aid of the wind; there the sea assumes the offensive and eats its way landward slowly and laboriously, but none the less successfully. The varying fortunes of this relentless and age-long war, which neither truce nor treaty will ever bring to an end, can be read in the shifting sands of the seashore. At many points along the coast of the Northeastern States are found bold cliffs, and the charging sea attacks them with the shot and shell of loose shingle. Some of them, however, are adamant and impregnable in their frontal fortifications and hold out against the sorest siege, but between them have occurred stretches of softer rock which have been literally pounded to dust by the ocean's heavy artillery, thus permitting flank attacks on the hitherto unconquered defenses.

Along the southeastern coast, however, the rock-bound cliff is the exception and the long stretches of glittering sand the rule. Here the sandy beach reaches out farther and farther into the sea, and the water is thus enabled to penetrate farther and farther into the land, because the attack of the sea is usually a frontal movement and that of the land frequently a wedge attack; thus we can account for the long straight shore on the one hand and the split on the other.

CAPE HENRY'S SMILING SANDS

Cape Henry, Virginia, where the great Chesapeake Bay empties into the Atlantic, is one of the most interesting points along the South Atlantic coast. It af-

Photo by H. C. Mann

A BATTLE-FIELD NEAR THE VIRGINIA CAPES

The sea and the sand never seem to weary of the conflict along the coast-line of the South Atlantic States, and, as a result, the formation changes considerably from year to year. Battleships of the North Atlantic Squadron steaming out to target practice from Hampton Roads, where the world's first ironclads matched strength.

Photo by H. C. Mann

THE OLD AND NEW LIGHTHOUSES: CAPE HENRY, VIRGINIA

The old lighthouse at Cape Henry has the distinction of being the first light built by the young government of the United States. It served as a beacon for vessels entering from the ocean through Cape Charles and Cape Henry for nearly a hundred years. Note how the beach has traveled seaward in a century, leaving the old lighthouse high and dry on its solid hill, the bottom of which was, at one time, the records show, swept by the tides.

fords an excellent opportunity to study the battle royal between the sea, the winds, and the sands, and it is remarkable also for the weird beauty of its storm-buffeted beach, extending in broken masses of sand as far as the eye can reach, picked out here and there along the land edge by gnarled and stunted trees, beach grass, and hardy shrubs, which make a brave fight against the ever-encroaching enemy.

Cape Henry dates back to the early years of the sixteenth century, when a brave little fleet of three vessels, the largest being only 100 tons and the smallest less than 15, set sail from London, under the command of Capt. Christopher Newport, for the West Indies. Encountering great storms on their lonely journey of months upon the angry Atlantic, the voyagers finally won their way to a landfall and entered the Chesapeake, to find a well-deserved resting place at Roanoke Island, the early English settlement. They decided, however, to stop midway, and high on the beach where they landed a wooden cross was erected in thanksgiving for their safe arrival, and the little band took possession of the territory in the name of their country, calling the spot "Cape Henry" in honor of the Prince of Wales and brother of Charles the First, their king. Later they crossed the bay to another and more sheltered harbor, naming the place for that reason "Point Comfort," which is today known to thousands of travelers who throughout the year delight in its remarkable climate and healthful surroundings, its splendid hotel accommodations and safe harbor, as Fortress Monroe and its guns guard the entrance from the sea.

At Cape Henry in 1791 was erected the first lighthouse built by the young United States government, a great tower of rough-hewn stone, which was indeed a welcome sight to storm-tossed mariners coming in from the broad Atlantic through the 14-mile entrance between the Capes, Henry and Charles. After many years of faithful service the an-

Photo by H. D. Wood

SAND BEING BLOWN IN FROM THE BEACH: SHACKELFORD BANK, NORTH CAROLINA

The sand comes inland at this point on the island at the rate of one-quarter mile per year

cient beacon gave way to a more pretentious structure, which was erected in 1881, but the old lighthouse still stands on its great hill of sand and rock like a sentinel of a forgotten army ready to spring to arms when called.

Stretching inland behind the original lighthouse is a great dune, or rather a mountain of sand, which has been the savings bank of the winds for untold centuries. The dune is more than 100 feet high in many places, and the great plateau on its crest, stretching back into the country for several miles, covers an area of many acres. Slowly but surely the great mass of sand crystals is making its way toward the interior, being pushed back inch by inch by the restless wind, and it is mercilessly engulfing a great pine forest, stretched by a kind Providence across its path, but in vain, for, indeed, nothing seems to successfully withstand its relentless, onward march; it is even rapidly filling up the Lynnhaven River, a small fresh-water stream famous for its splendid oysters, which seeks to bar its progress.

The advance of the giant sand dune greatly resembles the movement of a glacier, except that the sand engulfs its prey without sound or groan from either the victim or the conqueror.

A FAR-FLUNG BATTLE LINE

The formation of the beach immediately guarded by the Cape Henry light is not changing so rapidly as is the case only a few miles on either side because of its somewhat protected position, due to the many sand bars or reefs far out from shore, which, acting as the first trenches, serve to break the charge of the white horses of Father Neptune as they dash in from the ocean, and, because

Photo by H. C. Mann

A BEACH SENTINEL

Standing alone on the beach edge and unprotected from the attacks of the wind enemy, the tree fights for its life winter and summer. Note that the branches and limbs grow on the lee side, while the trunk is permanently bent by the force of the wind.

Photo by H. C. Mann

A GLIMPSE OF THE SAND BEACH IN WINTER

of this knowledge of defense, it is plain to be seen that a good quarter of a mile of beach has been added by the defender since the old light was erected.

The War Department, having realized the great value of Cape Henry's position from strategic reasons, is preparing plans for fortifications which will extend for several miles along the beach at this point. So it is that a human ally has been enlisted on the side of the land army to fight with it side by side, and every resource of man will be brought into play in order to outwit the salt legions of the deep, who hereafter can only hurl themselves first upon the sand-reef outposts and then fruitlessly expend their remaining strength upon the stone ripraps of the human ally.

ATTACKING THE ISLANDS OF CHESAPEAKE BAY

Even inland waters take their toll from the lands which border them and the islands which are surrounded by them. In the Chesapeake Bay one finds many instances of the constant attack and siege by the water enemy, and how these processes go on all the time may be strikingly shown by many of the old records.

When the United States survey of the Chesapeake Bay was made in 1848, the area now known as James Island was a peninsula, a narrow isthmus connecting the island with the mainland. In only 50 years this entire isthmus has been cut away, and a distance of a quarter of a mile now separates the island from the mainland. At the time of the 1900 survey of the Chesapeake waters the west shore of James Island had receded 500 yards beyond the head of the inlet of 1848. The inlet had been filled in and the sand-bar separating it from the bay had shifted eastward. In area the island had decreased from 975 acres in 1848 to 555 acres in 1901. During the succeeding nine years it was cut down to 490 acres. So one can see that in 62 years 485 acres, or nearly half of the island, disappeared.

In 1849 Fishing Point, on the eastern shore of Maryland, was but a bend in the coastline. By 1887 we find that it had reached out two miles in a southerly direction, and since then it has gone more than a mile further, sharply curving to the westward.

Near the mouth of the Choptank River, on the eastern shore of Maryland, is located what is left of Sharps Island, at one time the home of a summer colony, where many national celebrities hunted and fished in bygone years. The island is washing away so fast each season that it is now estimated that in 27 years the last acre of it will lie submerged under the waters of Chesapeake Bay. In the earlier days the north end of Sharps Island was well wooded and a favorite spot for hunting duck and other small game. Today life on the island is but a memory, save for an artesian well which, having been transgressed by the sea, now presents the unique feature of a well in the midst of the salt waters of the bay. The trees have vanished and the houses have been washed away, and only the crumbling ruins of what was once a spacious hotel remain to tell the story of the one-time prosperous island, which has for years been slowly yet surely sinking beneath the waters. In 1848 the island covered an area of 438 acres, while in 1910 only 53 acres remained.

A RELENTLESS TAX COLLECTOR

Tilghmans Island, which lies about 50 miles south of Baltimore, is three and one-half miles long and provides homes for many farmers and fishermen. At the north end are the towns of Tilghman and Avalon. The island is separated from the mainland by Knapp Narrows. Since 1848 the owners of the lands of the island have had to pay a very heavy tax to the sea. In that year the area of their joint holdings amounted to 2,015 acres; in 1900 the tax collector of the winds and waves had cut these holdings down to 1,686 acres, and since 1900 the work of erosion has been going on at the rate of 29 feet a year.

Not only have the islands of the Chesapeake Bay suffered, but the mainland as well. Cooks Point has been losing about two acres a year. Ragged Point has been cut away at the rate of about 14 feet a year. Nelson Point has had to surrender a quarter of a mile of its territory in a single generation.

Nor is the work of erosion confined to the bay; it also spreads up the mouths of the rivers and creeks. Willeys Island, at the mouth of Broad and San Juan creeks, has lost 40 acres, or half its area, in 50 years.

A very careful study in matters of erosion is being made in the region around the mouth of the Choptank River by the State and the United States Coast and Geodetic surveys, with the hope of mastering the details of erosion by evolving better methods for combating the encroachments of the water enemy.

WAR'S RECORD IN THE SAND

Rockaway Beach, Long Island, grows westward at the rate of nearly a mile every 20 years (see chart on page 206). At Nag Head, North Carolina, the land has extended into the sea at the rate of 35 feet a year. In 1804 Dr. Nathaniel Bowditch prepared a chart of Salem and Marblehead harbors, giving the soundings over various ledges of rock. Ninety years later similar soundings were taken, and in all cases the water was found to be considerably deeper, once again telling the tale of endless warring.

On the shore of Cape Cod, near Chatham, the land is retreating at the rate of a foot a year, and on the southern shore of Martha's Vineyard it is giving up the fight to the enemy at the rate of three feet every 12 months, while on the southern face of Nantucket the retreat has been as much as six feet a year, the records tell us.

Unfortunately, in the United States we have no definite records by which to ascertain the aggregate gain or loss of area that is taking place on our seaboard as a result of this warfare between the land and the sea. In England, however, where more attention is given to the matter, the total has been figured out, and it is reasonable to suppose that the figures offer a fair average of the yearly change. One

Photo by H. C. Mann

THE LOW-LYING SHORE-LINE OF THE SOUTH ATLANTIC

The wiry beach-grass seed, dropped by the passing bird or blown from inland, grows readily on the sandy shores, and by its interlacing root-stocks creates a binder and anchor for the wind-driven sand

Photo by H. C. Mann

A FORTIFICATION OF THE LAND FORCES

Starting perchance with a piece of driftwood or wreckage thrown high up on the beach by the tide, the sand is offered a chance to rest, and in time the dune grows. Thus are the land defenses builded, and they catch and hold every wind-blown passerby, be it shell, twig, or sand crystal

Photo by H. C. Mann

ON THE EDGE OF A TRAVELING DUNE

authority who gathers statistics on the subject says that every year England loses a tract of land larger than Gibraltar, and the English east coast alone is deprived of a tract larger than half of the area of Heligoland. The same authority estimates that, since Waterloo, England has lost to the sea a fragment of its territory larger than the county of London.

ONCE A DEER PARK, NOW AN ANCHORAGE

The Anchorage Basin, off Selsey in Sussex, is still called "The Park" because it was once a shooting preserve of Henry VIII, who filled it with deer, and as further proof old court records show that certain deer stealers were severely dealt with for poaching in its confines.

In a great number of instances along the Atlantic coast of the United States one may see lands in the process of disappearing and others coming to the surface or shifting their positions. Sable Island, in the mouth of the St. Lawrence, is gradually being banished from the map by the attrition of the sea; No Man's Land, a lonely island on the Massachusetts shore, is yielding ground inch by inch, and it is estimated that before the second centennial of Waterloo it will have entirely disappeared from the face of the earth.

From Portland, Maine, to Cape Florida there is a fairly well connected barrier of sand-reefs, all of them built up by the sea and its ally, the wind, from the material pounded from the shore-line by the waves. From Chesapeake Bay to Biscayne Bay, Florida, a distance of 700 miles, there is a natural rampart of sand so continuous, fencing such an unbroken series of lagoons in from the sea, that it is possible to make the entire journey through inland waters without exposure to the open sea.

JACK-IN-THE-BOX ISLANDS

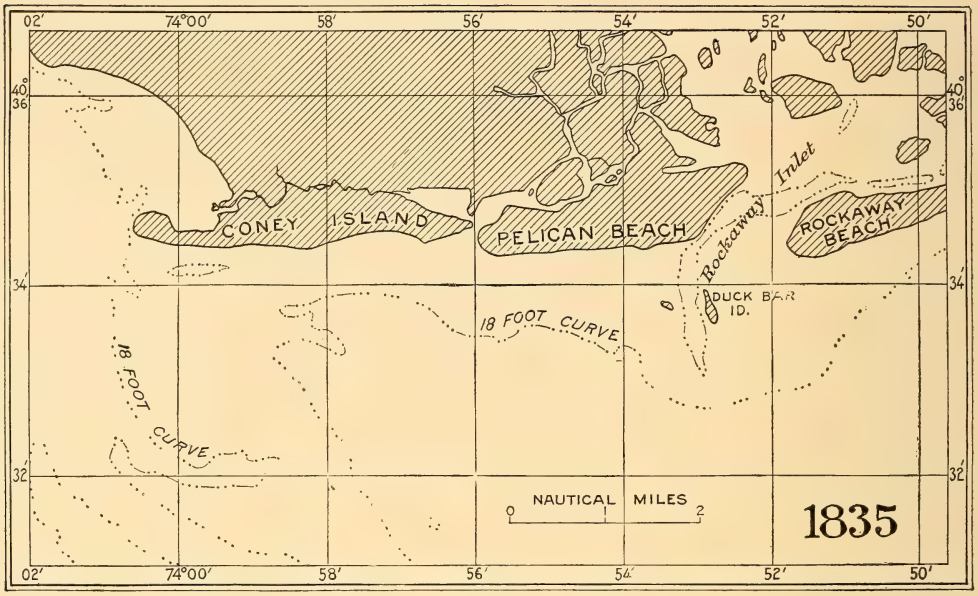
We need only to turn to our Alaskan possessions to see that other sort of appearance and disappearance that has turned the bed of the sea into mountains and mountains into the bed of the sea. In the Aleutian Peninsula are found the Bogoslof group of islands, some of which have for many years been playing "jack-in-the-box," with the sea for its audience. Now and then one of these islands sinks away, and where land was there comes a void of water. Years pass, a submarine volcano comes into play, and where yesterday there was water, today a volcanic peak towers high above the waves, uncharted and unknown until reported by some surprised and mystified mariner.

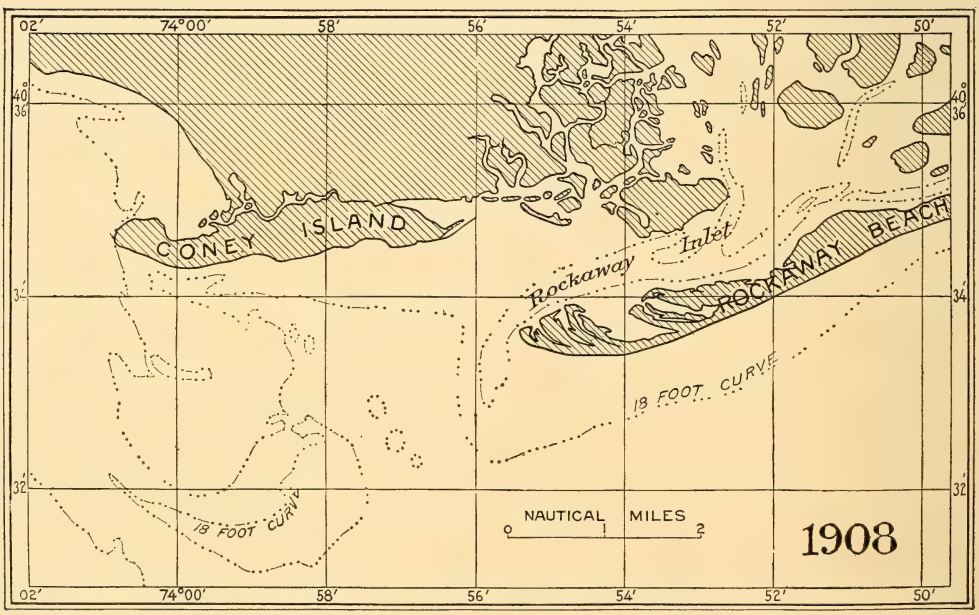
In its incessant warfare against the land, the sea literally takes its captured hosts and makes them do battle under its command. The boulders that are shattered from the face of a cliff are dashed up against it again and again, hammering others loose, the while being worn round and smooth as the projectiles of big guns must be. As the process goes on, these huge shells are worn down and crumbled until there remains nothing to tell the story of forced fighting against their own stronghold, save grains of sand on some distant beach or the soft carpet spread upon the floor of the sea many fathoms deep.

How rapidly this process goes on is sometimes strikingly shown. A schooner laden with bricks is beached on some bare shore in a storm; these bricks are rolled and tumbled a distance of five miles or so in the course of a year, and by that time attrition has usually completed its work. Authorities say that on the shores of Cape Ann a fragment of stone as big as a nail keg has been worn completely round by its constant turning during the course of but five years.

A ROVER'S FATE

Some years ago there was discovered in the British Records Office an elaborate map of the North American coast from Cape Cod to the Navesink Hills, which is believed to date from about 1715. It gives a wonderful illustration of the changes that a coastline may undergo in 200 years. To begin with, it shows that Cape Cod was at that time an island, and that near the point where the new Cape Cod Canal now cuts off the toe of the peninsula there was a natural passage from the Atlantic to Cape Cod Bay. The point is located where the channel existed, and the following notation was put in by a





Charts from George R. Putnam

MOVEMENT OF ROCKAWAY BEACH AND INLET FROM 1835 TO 1908 (SEE PAGE 201)

British officer, probably Capt. Cypian Southback, sent out to capture Bellamy, the pirate:

"Ye place where I came through with a whale-boat, being ordered by ye Governor to look after ye pirate ship *Whide*, Bellamy, Commander, castaway ye 26th day of April, 1717, where I buried one hundred and two men drowned."

On this chart the islands of Nantucket and Martha's Vineyard are shown as a group of six islands. A very great number of other changes in shoreline topography are noted.

NEW JERSEY'S EVER-CHANGING BEACH

A survey of the coast of New Jersey shows strikingly the results that are wrought upon a shoreline by the wind and the waves.

The beaches for the most part are being driven back by the sea, but the harbors, which were accessible to coasters quite within the memory of men now living, are being closed by the traveling drift, just as most of the mouths of the streams emptying into the ocean have been closed and salt-water marshes formed.

In a description of the Jersey coast, published in 1879, it was stated that, prior to the War of 1812, Old Cranberry Inlet was one of the best anchorages on the coast, and it afforded a safe harbor for American privateers on the lookout for British ships during the Revolution. It opened one night by the angry sea breaking across the beach, and during the last year of its existence as a harbor the whole channel drifted nearly a mile to the northward. Its closure, about 1812, caused so much inconvenience that, in 1821, one Michael Ortley attempted to cut a new inlet near the head of Barnegat Bay. With the assistance of others, it was finally finished; but the following morning, to the amazement of the voluntary workers, it had closed up again. Later another effort was made to effect the same thing lower down the bay. The cut was completed July 4, 1847, the work being done by several hundred men under Anthony Ivens, Jr. The water was let in, and the entire community sent forth its thanksgiving, but quite too soon, for it filled up almost as quickly as the Ortley cut, so relentlessly was the sea's war carried on.

A few years ago Louis M. Haupt made a report on shoreline changes in New Jersey, and called attention to the fact that the charter of Atlantic City, published in 1854, "lays out metes and bounds, with no accessible point of beginning or permanent corner, without a course or a distance, and no well-defined contents." He then adds, "This tract of land on a shifting island is set apart as constituting the site of one of the most popular seaside resorts in the world," the legislature of New Jersey having assumed that Father Neptune's forces will never dare to disturb the site!

A survey at Atlantic City, in 1863, revealed the fact that in the course of but a few years the shore at Maine avenue had lost 76 acres. True, most of this material was deposited in the lee of the point extending from New Jersey to Ohio avenues, causing an advance of the beach lines at Pennsylvania avenue of about 1,000 feet and adding to this part of the plat some 56 acres, all in the brief space of a decade. This transfer of property from one riparian owner to another without consideration is not provided for in the statutes, but might properly be regarded as inequitable, especially to the original owner. However, no one has yet gone into court for an injunction against the sea for thus robbing Peter to pay Paul.

A VICTORY FOR MAN

When the lighthouse at Atlantic City was threatened, in 1878, the United States challenged the sea by the construction of a jetty at the head of Atlantic avenue. Thus was inaugurated a series of defensive works, which have been continued from time to time by individuals, so that 82 additional acres have been reclaimed from the sea to the great benefit of the city, as well as to that of the riparian owners; but they had to fight hard for every inch.

The changes in the coastline seem partial to no particular locality. At Ocean Grove, New Jersey, and at Point Pleasant investigation shows traces of tide-

Photo by H. C. Mann

WHEN EVENING SHADOWS FALL

marks in places fully a mile inland. At Absecon houses now stand at a point that was low tide in 1850, while Sandy Hook is now nearly 1¼ miles northwest of its stated position in 1764, when the lighthouse there was built.

The shifting of the sands of the seashore very often involves expensive litigation. In 1885 the counties of Atlantic and Burlington of New Jersey entered into an expensive litigation concerning the boundary between them. There was a dispute as to one of the corners of this boundary. It was stated to be, in the original survey, "the next inlet in the south side of Little Egg Harbor's most southerly inlet, and thence along the seacoast to the line of partition between east and west Jersey." But it could not be found in its original home when they went to look for it, thus bringing up to date the ancient saying about a rope of sand.

THE TERRIFIC WAVE FORCE

The unusual force with which the sea attacks the shore is revealed by a series of investigations made in Great Britain. These show that winter breakers which exert a pressure of three tons per square foot are not unusual. Sometimes these breakers have been so powerful that they have moved blocks of rock exceeding 100 tons in weight. Ground-swells sometimes cover the cliffs of northern Scotland with sheets of water as high as 200 feet, while the Dunnet Head lighthouse, whose windows are nearly 300 feet above high-water mark, has occasionally had its windows broken by stones swept up the cliffs by sheets of sea-water. It is estimated that the average force of the waves on the Atlantic coast of England is a ton per square foot throughout the winter months, but much less in summer.

The waves always find a most valuable ally in the wind while their work of coastline transformation goes on. The possibilities of the wind as a worker in conjunction with the waves are revealed when we consider that during a violent storm the air may hold in suspension as much as 126,000 tons of sand to the cubic mile. This sand, driven hither and thither, finds a resting place somewhere, and that resting place is usually a dune along the shore.

THE CAVALRY OF THE ALLY

A sand dune always has a humble beginning. A piece of wreckage cast up by the waves may start it, or any sort of obstacle lying upon the shore may cause it to come into being. Once started the dune becomes a trap to catch sand in. It takes its toll of every passing gust of wind, and thus continues to grow and grow. Often they keep advancing until they bury orchards, forests, and even buildings, like great drifts of snow (see page 203). Along the coast of New Jersey one may see orchards which have been covered by wind-blown sand within the memory of man so that only the tops of the trees now protrude above the surface. It is not exceptional to see a forest invaded (see page 210) and sometimes even completely buried. To watch the struggles of the trees against their encroaching enemy is one of the most remarkable sights of nature. As the sand rises around their trunks new roots are put out near the surface, and they continue to fight their battle month in and month out, but generally they are finally completely engulfed.

Trees which are in process of being buried under sand are equipped to make a stubborn fight for their life; on the other hand one buried under water gives up the ghost as soon as the water rises above its roots. A water-submerged forest was never seen anywhere to better advantage than at Panama when the waters of the Chagres River were impounded in Gatun Lake.

The alternating burial and resurrection of forests is due mainly to the tendency of sand dunes to migrate. On Hatteras Island, North Carolina, the migration of a dune literally robbed a cemetery of its dead, dashing down the gravestones and exposing the bones of the bodies buried there, says Professor Cobb, an authority on the subject of beach formations.

On the northern end of Hatteras Island a fishing village has been completely buried, while the sand has entirely crossed the island at several places north of Cape Hatteras. This movement of sand was

Photo from the U. S. Geological Survey

A TRAGIC SAND VICTORY

The barrier in this picture shows how man has come to the aid of the earth in its attempt to resist the invasion of the sands. The picture represents a forest buried by the crest of a sand wave on Shackleford Island, near Cape Hatteras. As it advances the wave buries everything in sight—house, field, and forest alike. In its rear it leaves, in turn, uprooted trees, undermined houses, and graves that have been forced to give up their dead.

started just after the Civil War by the cutting of trees for ship timbers, and, although the section is known today as the Great Woods, there is not a stick of timber to be seen.

HOW MAN'S FIGHT IS MADE

The men who live along the seashore have learned, in a measure, how to combat the migration of the sands. While in some instances there are kinds of wind breaks which have helped, the most effective mode of warring against the migrating tendencies of the sands is found to be that of employing plant life as an ally. Various kinds of grasses and rapidly growing trees which flourish in sandy soil have been planted over the dunes, and as they take root they bind the sands to earth and prevent them from blowing away. This method of combating the shifting spirit of the sand dune has been more widely used in Europe than in America, yet everywhere that it has been employed it has given the most excellent results.

Another force, indirectly related to the wind and the wave, which has done much to alter the shoreline of the world, is the erosive power of running water.

THE POWER OF RUNNING WATER

It is estimated that the rivers of the earth carry 6,500 cubic miles of water to the sea every year. If the reader can imagine a column of water 10 miles square and reaching 65 miles skyward, he will get a fair idea of the tremendous work that the sun and the winds have to do in pumping up this water out of the sea and carrying it over the earth. Perhaps a third of this is expended on the landed area of the earth. Imagine a falls half a mile high and as large as 10,000 Niagaras tearing away at the continents every day and wresting material from them and transporting it to the sea. This represents the work of the running waters. The Mississippi River alone carries more than 1,000,000 tons of material to the Gulf of Mexico every day. It would require nearly 1,700 Lidgerwood dirt trains, such as were used at Panama, to move each day's deposits that the Mississippi brings to the Gulf. The total bulk of material removed annually from the Mississippi Valley into the Gulf through the Mississippi River is greater than the total amount of material removed from the Panama Canal, as it stands today, by the French and the Americans. In view of this fact the statement of General Goethals, the builder of the Panama Canal, that the man who attacks the task of deepening the Mississippi River will have the biggest engineering job ever undertaken by man, indeed becomes significant.

THE WORK OF CONTINENT BUILDING

How rapidly the Mississippi is carrying forward its task of changing the shoreline of Louisiana is revealed by the fact that it is building a mile of Louisiana territory into the Gulf every 17 years. Its delta, assuming that a delta begins at the first point where a break occurs and river water escapes to the sea, is now more than 200 miles long. This territory, which has been entirely built up by the river, now contains nearly 12,000 square miles, making it equal in size to the State of Maryland. For every fifteen hundred pounds of water that the Mississippi carries to the sea it carries one pound of material, either solid or in solution. It carries down to the sea nearly eight times as much material as the Nile, whose alluvial burdens have enriched Egypt for thousands of years.

THE EARTH'S RESPIRATION

Another agency that has had wonderful effect on the shorelines of the earth is that of the alternate subsidence and elevation of lands. There are many scientists who say that a large portion of the eastern coastline of the United States is now undergoing a subsidence, and they point to many remarkable facts in support of that theory. For instance, at a navy yard on the New England coast, it is shown that high and low water marks have shifted in recent decades. There are those who claim that this merely indicates a compression of the land and not a subsidence. But this objection is answered by the statement that while high and low water marks have shifted, points on shore bear identically

Photo from U. S. Geological Survey

AN INVADING SAND ARMY

The sloping stretch advancing on the buildings is not a snow-drift, but a shifting dune that has marched out of the sea. The photograph was taken at Nags Head, North Carolina, just off Roanoke Island, celebrated in history as the scene of Sir Walter Raleigh's unsuccessful attempt at colonization in 1585.

Photo from Bureau of Lighthouses

LIGHT STATION: HERON NECK, MAINE

Along the North Atlantic coast Father Neptune needs his heaviest guns, for the hard rock cliffs of the coastline offer great resistance to the attacking sea

the same relation to one another that they did before.

The geological history of the Panama Canal region well illustrates how the lands alternately subside and rise. On the Atlantic side, the fact that the ancient bed of the Chagres River is more than 100 feet below the present land surface was the principal cause of the fear in the minds of some engineers that Gatun Dam would not be stable. On the other hand, not far from Panama City, there is a beach where Indians formerly tied up their boats that is now many feet above the surrounding water and some distance back from the shoreline.

The charting of the 20-fathom line along the Atlantic coast from the North Carolina-Virginia boundary to Cape May reveals the fact that if the ground were to rise 20 fathoms or the sea to sink 20 fathoms there would be no Chesapeake Bay and no Delaware Bay. The shoreline between these points would be almost direct, with only very small, open bays and peninsulas. The geological history of the Chesapeake Bay region, in fact, shows that once there was no such

Photo by C. A. Harbaugh

THE WARNING

The splendid work of the U. S. Life Saving Service, now known as the Coast Guard, is familiar to all. During the night, winter and summer, in calm or in hurricane, or in case of stormy or foggy weather by day, a guard walks the beach between stations, ready to warn mariners too far inshore of the dangerous reefs by burning colored signals.

bay. The Susquehanna River in those times flowed to the sea between Cape Charles and Cape Henry. The subsidence of the valley let the sea-water in and drowned the Susquehanna out up as far as its present mouth. The Potomac River was then a tributary of the Susquehanna, as were also the James and the Rappahannock.

When we remember that subsidences and elevations of the land have been the rule and not the exception in the geological history of the world, and that careful studies reveal the fact that they are still taking place, and when we further recall all of the shoreline changes that are going on and which have been recounted above, it becomes evident that the geography of the earth is not a fixed one, and that while nature may change the boundaries of nations and empires more slowly than man himself is doing and has done, yet the process is going on with such vast and unmeasurable force that man is powerless to resist it, and at the same time unable to perceive it unless he calls history to his aid and measures in centuries instead of years.

The particular attention of the reader is directed to the photogravure series which follow. These unusually beautiful studies were made by Mr. H. C. Mann, who takes rank with the foremost photographic artists in the country.

Photo by H. C. Mann

SHELTERED FROM THE SAND ENEMY

Sunset on the little Lynn Haven River, near Cape Henry—not far from where the giant dune is attempting to force a passage from shore to shore and so continue its never-resting inland journey.

Photo by H. C. Mann

OUTRIDERS OF THE FOREST

Standing upon this little knoll of mother earth, these sturdy trees present a fair target for the enemy who, some day, will claim them as prisoners of war.

Photo by H. C. Mann

THE REAR GUARD

Well back from the beach, the pine forest edge offers great resistance to the sand migration, but slowly succumbs to the overwhelming force of the advancing legions urged ever onward by the wind ally.

Photo by H. C. Mann

THE TRUCE

Peaceful it now seems, yet a few hours hence the battle for domain on one side and existence on the other may be raging, with no quarter asked or given.

THE SIEGE GUNS OF NEPTUNE

The terrific force with which the sea batters at the shoreline defenses can best be gathered from estimates which give the average force of the waves, during the winter months, on the Atlantic coast, as from one to three tons per square foot. Small wonder, then, that in time many citadels surrender.

Photo by H. C. Mann

SENTINELS OF THE PAST

The battlefields of the coast war present a drear aspect when night approaches, for the remains of ill-fated trees take on the semblance of skeleton fingers pointed accusingly at the sky. This sand waste stretches inland for several miles at Cape Henry and is known locally as the Desert.

Photo by H. C. Mann

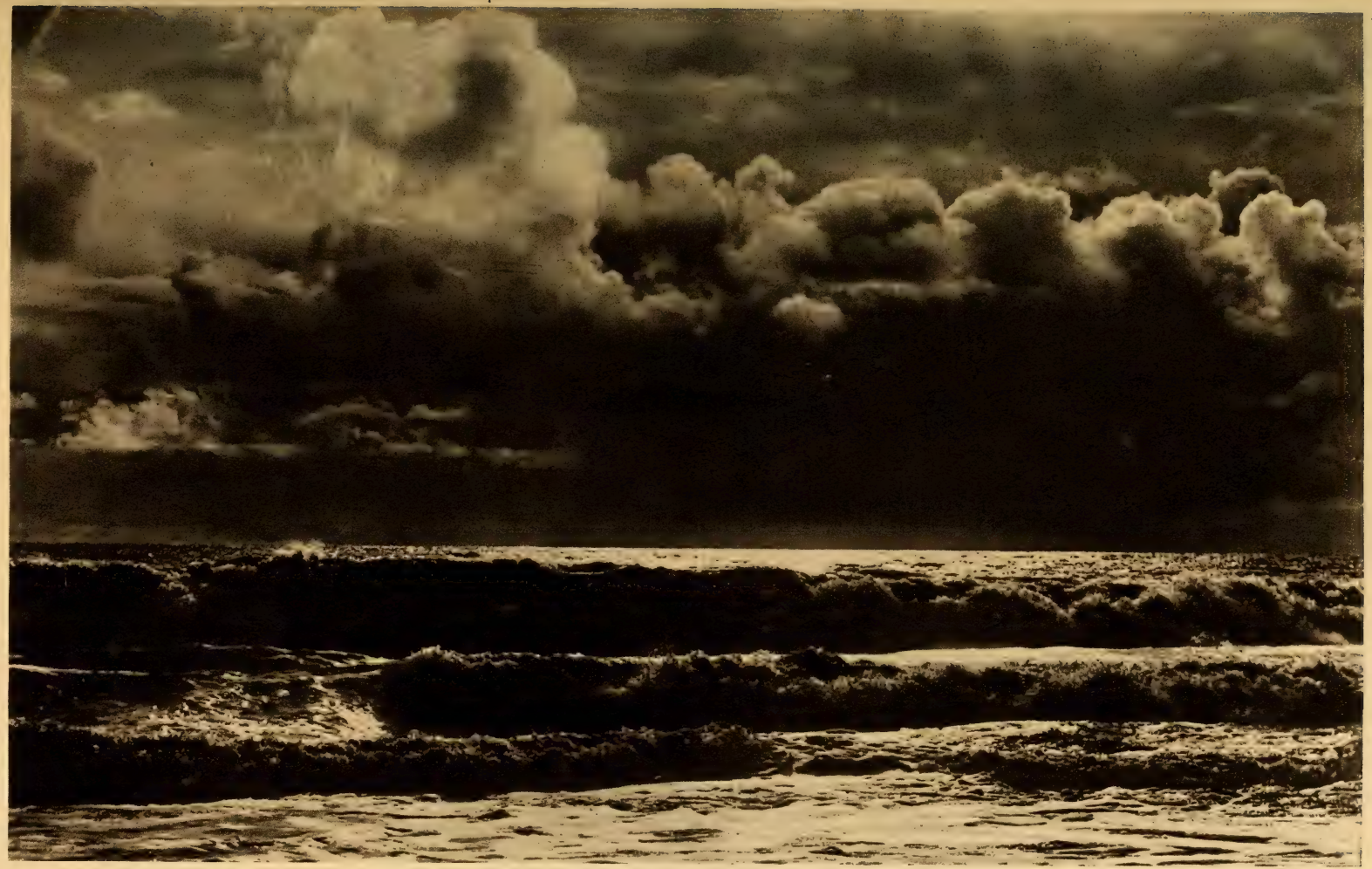
THE RELENTLESS ENEMY AT WORK

Slowly, but with never-ceasing force, the sand army advances to engulf the forest, and one by one the giants of the pine woods are giving up the ghost.

THE CHARGE OF THE OCEAN'S LIGHT CAVALRY

Photo by H. C. Mann

It needs only to hear the whistling signal of attack from its ever-changing ally, the wind, and then the heavy artillery of Father Neptune is rushed forward in a solid wall of foam-topped green and the skirmish line of light cavalry, having done its part, merges with the storming phalanx.



ADVANCING TO THE ATTACK

Photo by Putnam & Valentine

With the ever-shifting wind behind, the force of the water is gathered as it advances, and the encounter with the out-guard of sand reefs serves only to check its fury for the moment, as it hurls its strength upon the land enemy. Line after line makes its attack, and then falls back slowly with its captured ammunition.

Photo by H. C. Mann

SIGNS OF STORMS

A spot along the borderland of sand and water, near Cape Henry, Virginia, protected from the fiercest fighting, being a few feet higher and back of the open beach. Here the tough beach grass and scrub make a determined stand.

Photo by H. C. Mann

A BATTLEGROUND OF NATURE

Along the beach at Cape Henry, Virginia, when the day is nearly done.

Photo by H. C. Mann

A DISPUTED TRENCH

To this point the invading ocean has carried its banner time and time again, but finds a stubborn resistance on the part of the land forces.

Photo by H. C. Mann

A SAND DUNE CROSSING A RIVER

The giant dune, stretching for several miles inland at Cape Henry, Virginia, is confronted by the problem of a small river on its way to the sea. Undaunted by this obstacle, the dune has filled in nearly half of the river bed and will eventually cross the stream, unless the hand of man interferes.

Photo by H. C. Mann

THE WIND AT WORK

The sand is cut into ripples as far as the eye can see and piles up around the friendly wire grass in an effort to anchor.

Photo by H. C. Mann

WAR'S LIGHTENING IN THE SKY

Storm cloud signals. The call to arms of the wind means that the land forces must look to their defenses.

Photo by H. C. Mann

WHEN THE ALLIES SLEEP

Off shore at sunset. To gaze upon the sea when at rest, one would scarcely suspect its warlike nature.

HISTORIC ISLANDS AND SHORES OF THE ÆGEAN SEA

By Ernest Lloyd Harris

EVER since the days when Aristogoras of Miletus endeavored to arouse Athens and Sparta to join forces with the Ionian Union in order to resist what he conceived to be the inevitable onslaught of the hordes of Persia, history has been repeating itself on the islands and in the countries bordering the Ægean Sea.

Upon this dividing line between Orient and Occident a struggle for supremacy has been going on for 2,500 years. We find Persian pitted against Greek, Roman against Pontian, Byzantine against Moslem, Crusader against Saracen, and Turk against Mogul. The battles of the recent Balkan war upon the plains of Thrace and the trench warfare of the present war on the Gallipoli Peninsula have been as stupendous, as bitter, and as cruel as any that ever were waged since the days when the troops of Mardonius first crossed the Hellespont.

Not only has Asia Minor and the islands facing its shores been the stage upon which have been enacted some of the most gigantic events in human history, but it is at the present time one of the most interesting and picturesque regions in the world. It has often been termed the quintessence of the East. For nowhere else will you find, thrown together in close association, so many things of the East—the camel caravan; the groves of cypress, olive, plane, and valonia trees; the mosque and towering

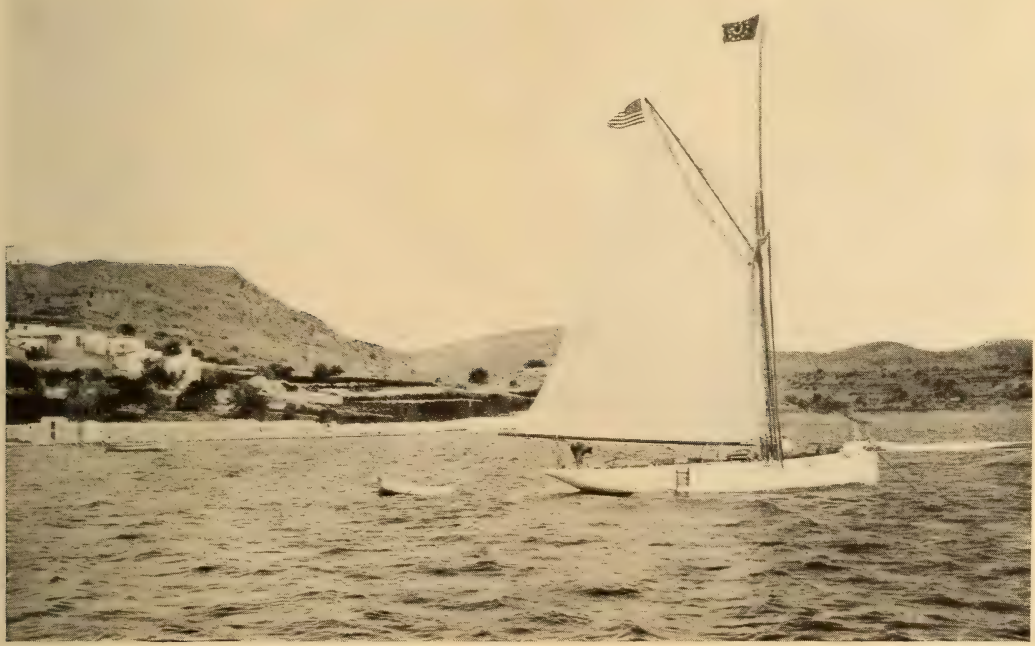


Photo by Ernest L. Harris

THE "VIOLET," UPON WHICH THE AUTHOR MADE HIS CRUISE AMONG THE ISLANDS OF THE ÆGEAN ARCHIPELAGO

The vessel was sufficiently large to carry three passengers, three seamen, and a cook

MAP OF THE GATES TO THE BLACK SEA

minaret; latticed windows and veiled women; quaint and picturesque costumes, and a background made up of the remnants of an ancient civilization in the form of ruined cities which dot the surface of the whole country.

A PLACE FOR THE ARCHEOLOGIST

And in this respect Asia Minor is being more appreciated from year to year. Thus far scholars have devoted their energies to the excavation and study of the ancient sites of Greece, and have neglected, to a certain extent, the broader field of research in Asia Minor. But this is gradually changing. The veil of darkness which has hung over the ruined Ionian cities for more than 2,000 years is slowly being lifted, revealing to view a throng of ancient sites which are replete with absorbing interest and full of mysterious charm.

I made the cruise among the islands of the Turkish archipelago in a cutter which was sufficiently large to carry three passengers, three seamen, and a cook. The little dining cabin was spacious enough to admit of six people being seated at table, a circumstance often appreciated when lying at anchor in some of the quiet little harbors of Samos and Chios. Thus, being my own master in every respect, I was at liberty to dispose of my time as I saw fit without being at the beck and

Photo by Ernest L. Harris

INTERIOR OF A MONASTERY ON THE ISLAND OF CHIOS, NOT FAR FROM THE LITTLE TOWN OF KASTRO

Its walls and alcoves are packed with the skeletons of the Chians who were massacred in this neighborhood by the Turks in 1822. It is claimed that the bones of five thousand people have been collected and thus placed on exhibition. The cellar of the monastery is also filled to overflowing (see text, page 238).

call of others. This fact enabled me to visit many places rarely sought out by the tourist and seldom even by the archæologist.

In sailing out of the harbor of Smyrna* the sites of the ancient cities of Clazomenæ and Phocæa may easily be visited. A few old walls of uncertain periods are all that is left to mark the place where these prosperous cities once stood. Many of the stones of the former have been removed to Smyrna and used as building material. Many peculiar sarcophagi were also unearthed here several years ago and sent to the new museum at Constantinople.

Clazomenæ was the birthplace of the philosopher Anaxagoras, and it is chiefly due to the fame of this great Ionian that the city has lived in history. While Anaxagoras left the place of his birth when still a young man, in order to link his fortunes with the intellectual age of Pericles at Athens, yet he remained the chief exponent of the Ionian school of philosophy.

The sister city of Phocæa, situated at the entrance of the harbor, not far from the mouth of the Hermus River, is known chiefly as the mother city of Marseilles. Following in the footsteps of

* For a description of Smyrna see NATIONAL GEOGRAPHIC MAGAZINE, December number, 1908, Vol. XIX.

Photo by Ernest L. Harris

A CHARACTERISTIC LANDSCAPE ON THE ISLAND OF CHIOS

Chios has a population of approximately 70,000. It is celebrated for its beauty and fertility, although the landscapes in some places are barren and uninviting

Photo by Ernest L. Harris

WINDMILLS ON THE ISLAND OF CHIOS

One feature of the scenery of Chios is the picturesque old windmills which crown the ridges and slopes along the coast. The wheels are of very large dimensions and fitted with sails, which supply the motive power for grinding corn. They are different in their construction from those of Holland.

Photo by Ernest L. Harris

A HIGHWAY SCENE ON THE ISLAND OF CHIOS

Earthquakes are not infrequent in Chios, and as insurance against damage by them houses are seldom built more than two stories high. When scattered along the country-side, where they are usually surrounded by olive or pepper trees, their peculiar architecture lends beauty and charm to the landscape (see text, page 238).

Phœnicia and Miletus, the Phocæans became great seafarers and colonizers. What the former did in Rhodes, Crete, and Carthage, and the latter along the shores of the Black Sea, this Greco-Ionian town duplicated in Corsica and on the coast of southern France.

From the headland of Kara Burun (see map, page 232) the view to the south is extensive. Outlined against the horizon may be seen the sharp peaks of Nicaria and Samos, while near at hand the green valleys of Chios lie spread out in pleasing contrast with the blue of sea and sky.

A HEROIC ISLAND

Chios has long been a bone of contention between Turk and Greek, and during the earlier part of the nineteenth century was the scene of some of the bloodiest tragedies known to history.

As early as 700 B. C. it was one of the richest and most important members of the Ionian Union. It has disputed with Smyrna the honor of being the birthplace of Homer. When the Ionian cities rebelled against the Persian yoke, Chios manned and equipped 100 ships and sent them to the battle of Lade. This stands for something when we take into consideration the fact that at that time, namely, 494 B. C., the population of the island numbered only 30,000 freemen and 100,000 slaves.

Chios has been, in turn, Ionian, Persian, Athenian, Roman, Italian, Turkish; and finally, in 1913, after a separation of

Photo by Ernest L. Harris

STREET SCENE AT VATHY, ISLAND OF SAMOS, SHOWING THE PALACE OF THE PRINCE IN THE FOREGROUND

nearly 2,300 years, it was united once more to the parent country, Greece. As one well may imagine, a little island which has changed masters so many times necessarily must have suffered much from the strife which swept over it.

Twice has this island been visited by terrible earthquakes. The first was away back in the year 17 A. D., and it was only through the fostering care of the Emperor Tiberius that the people were able to make a fresh start. The second was in 1881, when the town of Kastro was practically laid waste. Mosques, churches, and dwelling-houses disappeared into the bowels of the earth, engulfing no less than 5,000 people. This earthquake visited the whole island, and many beautiful and historic monasteries, some of which contained priceless objects of art, valuable libraries, and monuments of antiquity, were completely lost.

But in spite of all these vicissitudes Chios has also seen many happy days. Even in the old days of the Ionian Union it was celebrated on account of its commerce and industries, especially for its native wine, and the manufacture of beds and sofas. Under Rome the island was ruled as an insular province, and enjoyed several hundred years of almost unbroken peace and prosperity. The people have always been sober and industrious, and not only have they grown opulent in the various fields of commerce, but many have also succeeded in literature and art as well.

Chios's real troubles virtually began in the Greek war of independence. Somewhat against the will of the people, the island became involved in this struggle and was visited by a massacre which appalled humanity. In 1822 the Captain Pasha appeared before Kastro with a powerful fleet and landed an army of Moslems, who slaughtered, in the space of two months, no less than 30,000 Chians. It is also estimated that 32,000 were sold into slavery.

The entire island was given over to pillage, and scarcely a village, church, or convent was spared the flames. While it is true that the Chians, to a certain extent, provoked this attack, inasmuch as they were the aggressors, it cannot be denied, on the other hand, that their pun-

ishment was dreadful in the extreme. And, as might be supposed, their disappointment at the result of the Treaty of Adrianople, in 1829, which failed to unite them with the mother country, was very keen indeed.

"VICTORY FOR THE CROSS"

These acts of ferocity, however, did not remain unavenged. While the Moslems were ravaging Chios, the islanders of Psara and Hydra were planning an attempt on the Turkish fleet, which was lying in the outer harbor of Kastro, just off the Genoese citadel. The authors of this bold stroke were Constantine Canaris and George Pepines. They arranged two brigs as fire-ships and manned them with a chosen band of desperate men.

The lights hanging at the masts of the Turkish vessels were so dim that the Chians were enabled completely to surprise the unsuspecting crew at midnight. The brig commanded by Canaris immediately grappled with the Captain Pasha's flagship and set it on fire. Pepine was equally successful, and another battleship went up in flames. With shouts of "Victory to the Cross," the old-time war cry of Byzantium, the islanders escaped in a launch which they had in tow, without the loss of a single man. Practically the whole of the Captain Pasha's fleet was destroyed, and 2,300 lives were lost. Only a very few survived.

There is an old Greek monastery about an hour's drive to the south of Kastro, which stands as a gruesome monument of this period. Its walls and alcoves are packed with the skeletons of the Chians who were massacred in this neighborhood. It is claimed that the bones of 5,000 people have been collected and thus placed on exhibition. The cellar of the monastery also is filled to overflowing.

In view of such events, it is but natural that a deep feeling of hatred and fear should have possessed the hearts of the Chians and should have kept alive the desire to be joined to Greece, an ambition not realized until 1913.

One of the chief products of Chios is gum mastic, which is grown on the southern part of the island. It is used as a gum, and also distilled as a liquid, which is used throughout the Levant as an appetizer immediately before meals. When mixed with water this liquid assumes a pale milky color, and is an intoxicant if used in immoderate quantities.

Speaking of mastic reminds me of an incident which happened to the late Mr. Price Collier and me when we were being escorted through a big spirit factory in Stockholm. While various things were being explained the manager placed before us something which seemed strangely familiar to me, and great was my surprise when I learned that mastic not only was fabricated in Stockholm, but was also shipped in large quantities to the Levant in competition with the natural product of Chios.

Many pleasant drives may be taken from Kastro, along the coast and into the interior of the island. There are numerous olive groves, although not nearly so many as on the sister island of Mytilene.* The roads are not good, and the means of conveyance are rather uncomfortable, especially if carriages are used. In this respect Chios could emulate the splendid roads on the island of Mitylene, which are considered to be the best anywhere in the Levant.

A LAND OF WINDMILLS

One feature of the scenery of Chios is the picturesque old windmills which crown the ridges and slopes along the coast. The wheels are of very large dimensions and are fitted with sails, which supply the motive power for grinding corn. The landscape in many places is barren, especially the hilltops, but the valleys are usually fertile.

Owing to the possible visitation of earthquakes, the houses are rarely more than two stories high, and when scattered along the country-side are usually surrounded by olive or pepper trees, which add much to the beauty and charm of the country.

From Chios I sailed to the interesting harbor of Teos, on the mainland. A naval engagement once took place here between the fleets of Antiochus the Great

* For a description of the island of Mytilene see NATIONAL GEOGRAPHIC MAGAZINE, December number, 1908, Vol. XIX.

THE LAST STANDING COLUMN OF THE GREAT TEMPLE OF HERA: ISLAND OF SAMOS

"Herodotus declared that the Temple of Hera was the largest seen by him in all his travels. All that remains of this great temple today is one solitary column, with a number of drums missing at the top and heaps of ruins scattered about, partly hidden by high weeds. The whole scene is one of desolation" (see text, page 245).

and the Romans, which resulted in the destruction of the former.

Today this ancient town is ruined and deserted, and a few shepherds living nearby form the only signs of life in the neighborhood. Teos was once an opulent city of the Ionian Union, with stately edifices and all the refinements which accompany luxury and wealth. This is amply borne out by the ravished sepulchers, prostrate pillars, and inscriptions still extant. It was inclosed within a wall which must have been about four miles in circumference.

The chief ruins consist of the walls, the temple of Bacchus, and a theater. The temple at one time was one of the most celebrated structures in Ionia. The theater was a spacious one, but only the vaults which supported the seats now remain to give some idea of its former capacity. The galleries have long since disappeared or become covered with a thick layer of earth.

In the immediate neighborhood of Teos there are many tumuli, and situated near some hot springs are the ruins of a Roman bath. Teos would probably afford a good field for excavation, as little has been done in this respect, for a venerable olive grove now covers the major part of the ancient site.

Not far from Teos is the Turkish town of Sivrihissar, which is partly built from the sculptured marbles of the ancient city. Many inscriptions are seen in the sides of the houses and in the walls which partition off the gardens and lanes.

A TYPICAL LANDSCAPE ON THE ISLAND OF SAMOS

Photo by Ernest L. Harris

"It is difficult to realize that among these barren and denuded hills, which skirt the coast of both mainland and islands, there once throbbed the pulse of Ionian civilization; that these shores were graced with picturesque and happy cities, where hardy men and beautiful women lived content among unsurpassed natural environments and all the accomplishments known to any race" (see text, page 242).

Photo by Ernest L. Harris

WINDMILLS ON THE ISLAND OF SAMOS

The Ægean Islands helped to form the base upon which has been erected the edifice of modern statecraft, philosophy, science, and art; this atmosphere once was pervaded with poetic refinement and literary perfection that has called forth the greatest powers of emulation on the part of every nation which has since existed; and a school of architecture flourished here which reared gigantic structures at once the wonder and admiration of the ancient world (see text, page 243).

Photo by Theodore Leslie Shear

THE TOWER OF ST. NICHOLAS, AT RHODES, GUARDING THE ENTRANCE TO THE INNER HARBOR

This fort was built by the Knights of Rhodes in 1464, and, though frequently made the principal object of attack, it was never captured. One attack was frustrated by the bravery of an English sailor named Rodgers, who, observing that a bridge of boats was about to be thrown across from the opposite mole by a cable attached to an anchor fixed under the tower, dived into the sea, cut the rope, and saved the fortress.

A custom seems to prevail among the inhabitants of Asia Minor to use the tombstones from dilapidated Turkish cemeteries for the purpose of building walls along the roadside. It creates a kind of queer impression when riding along some of these lanes to be suddenly confronted by a number of slabs which bear inscriptions that probably read something like this: "Sacred to the memory of John Jones." When such a Turkish village is located in the vicinity of some ancient necropolis, it may be depended upon that there is a plentiful intermingling of Turkish and Greek epitaphs. While the Moslem population apparently cling with tenacity to the idea of the perpetuation of their burial places, there seems to be no particular reverence attached to the tombs themselves.

IONIAN CIVILIZATION'S PULSE

While rocking in a ship upon the swell between the mainland of Asia Minor and Samos, with the broad harbor of ancient Ephesus only a few miles away to the left, the influence of the past steals slowly over one, and soon there comes the mood for profound reflection.

It is difficult to realize that among these barren and denuded hills, which skirt the coast of both mainland and islands, there once throbbed the pulse of Ionian civilization; that these shores were graced with picturesque and happy cities, where hardy men and beautiful women lived content among unsurpassed natural environments and all the accomplishments known to any race; that this soil, these seas, were the recipients of the seed which developed into the base upon

Photo by Ernest L. Harris

AN ENTRANCE TO THE FORTRESS AT RHODES: ISLAND OF RHODES

With the arrival of the Knights of St. John, an interesting period began for Rhodes. This order was founded in Jerusalem in the eleventh century, and after many hardships finally found a home at Rhodes, where it assumed the name of the Knights of Rhodes. The power of the order was also gradually extended over a number of small neighboring islands, as well as the coast of the mainland (see text, page 259).

which has been erected the edifice of modern statecraft, philosophy, science, and art; that this atmosphere once was pervaded with poetic refinement and literary perfection that has called forth the greatest powers of emulation on the part of every nation which has since existed; and that a school of architecture flourished here which reared gigantic structures at once the wonder and admiration of the ancient world.

The island of Samos formed one of the oldest settlements of the Ionians in the Mediterranean, and from this point most of the colonies on the coast of Asia Minor and other parts of the Ægean Sea were established. During the second half of the sixth century B. C. the wisdom and skill of Polycrates won for Samos the first place in the Ionian Union.

As Tyrant this statesman and politician carried on successful wars with the neighboring islands, and he even formed an alliance with Amasis, king of Egypt. Polycrates caused great edifices to be erected, and, on the whole, did much to encourage the fine arts. In the year 522 B. C. he was decoyed to Magnesia* and doomed to a miserable death on the cross by the Persian satrap of that place.

With the death of this great man the prestige of Samos began to wane, and it gradually sank into insignificance. The island was also the birthplace of the great philosopher Pythagoras.

Samos came under the yoke, in turn, of the Athenian Greeks, Romans, Byzantines, Arabians, Venetians, Genoese, and finally the Turks. In the Greek war of independence Samos fought for Greece and successfully resisted every effort on

*For a description of Magnesia see NATIONAL GEOGRAPHIC MAGAZINE, December number, 1908, Vol. XIX.

Photo by Theodore Leslie Shear

THE WALLS RUNNING SOUTHEAST FROM THE TOWER OF ITALY TO THE SEA: RHODES

In 1522 Suleiman, with a mighty fleet of more than 400 ships and upward of 140,000 men, attacked the city of Rhodes with its garrison of 600 Knights and 6,000 soldiers. So valiantly did the latter defend the place, that the conqueror allowed the Knights to leave with all their ships and goods and guaranteed to those who elected to stay safety in person and property, free exercise of religion, and freedom from taxation for a period of five years. These engagements were strictly fulfilled, even down to May, 1912, although they gave the inhabitants of the islands certain rights and privileges not accorded to any other Ottoman subjects.

Photo by Ernest L. Harris

SCENE IN THE FORTRESS AT RHODES, SHOWING CANNON BALLS OF MEDIEVAL TIMES

the part of the Turks to maintain themselves on the island.

After a three days' visit at Vathy, I sailed the *Violet* around the island through the Strait of Mycale to the ancient town of Tigani. From this point I secured horses and returned through the center of the island to Vathy, sending the cutter back by the same way it came, to await my arrival.

The little town of Tigani is situated by the harbor of ancient Samos, and the immense moles once erected by Polycrates have, for the most part, been reconstructed. The walls, scattered fragments of a theater, and the celebrated underground aqueduct are the only remains of the ancient town, and they date from the time of the famous Tyrant. The walls which pass over the lofty ridge behind the harbor in the distance resemble the great wall of China. They are well preserved, and there are no less than 30 towers still standing.

Herodotus dwells at length upon the harbor, the conduit under the mountain, and the Temple of Hera. The aqueduct is a marvel of engineering skill, considering the time and age in which it was constructed. The end of the tunnel is situated about half way up the hill above the town, and with a guide and candles I was able to penetrate some distance into the channel. Such a visit is attended with some risk, because the flickering tapers are but an insufficient light in assisting one to pick a precarious way along the edge of a deep and narrow cutting.

THE GREAT TEMPLE OF HERA

The Temple of Hera was the finest monument ever erected on the island of Samos, and Herodotus says that it was the largest known to him in all his travels. All that remains of this great temple today is one solitary column, with a number of drums missing at the top, and heaps of ruins scattered about, partly hidden by high weeds. The whole scene is that of desolation, and one of the greatest shrines the world ever saw has been as irretrievably doomed to absolute destruction as have the sister temples at Ephesus and Magnesia (see page 9).

After a visit to the walls above the city, I descended into the adjoining valley and visited the springs which furnished the

THE STREET OF THE KNIGHTS IN THE CITY OF RHODES

Photo by Theodore Leslie Shear

In the days of the Knights the garrison of Rhodes was subdivided into companies according to language—companies of France, Provence, Auvergne, Castille, Aragon, England, Germany, and Italy—each responsible for the defense of a stated section of the wall. The best preserved of these houses is the Auberge de France, which retains still its medieval decorations, escutcheons, and grinning gargoyles. This house has been purchased by the French government to be maintained as a museum.

Photo by Theodore Leslie Shear

THE CHURCH OF ST. CATHERINE, TRANSFORMED INTO A MOSQUE AFTER THE TURKISH CONQUEST OF 1522: CITY OF RHODES

Photo by Ernest L. Harris

SCENE IN THE STREET OF KNIGHTS AT RHODES: ISLAND OF RHODES

The Knights built strong walls and towers, supplemented by broad moats, and constructed a convent, churches, a palace, barracks, hospital, and a meeting-house for different nationalities. They built so well that Rhodes today is little other than the city of the Knights

Photo by Ernest L. Harris

ANCIENT STAIRCASE AND RESIDENCE OF A KNIGHT OF ST. JOHN AT RHODES: ISLAND OF RHODES

Photo by Theodore Leslie Shear

LINDOS, THE BEST NATURAL HARBOR IN THE ISLAND OF RHODES

Within the castle of Lindos archæological excavations have laid bare the foundations of the Temple of Athene Lindia, with its porticos and numerous inscriptions. On the approach to the citadel is a strange relief of a galley cut in a rock, and numerous rock-cut inscriptions

Photo by Theodore Leslie Shear

THE TOWN OF LINDOS, OVERSHADOWED BY THE CASTLE OF THE KNIGHTS: ISLAND OF RHODES

Photo by Theodore Leslie Shear

ENTRANCE TO THE CASTLE OF LINDOS: ISLAND OF RHODES

The arms of the order of the Knights of Rhodes appear near the top of the walls of the castle of Lindos. An idea of the size of the structure may be gathered by noting the comparative size of the man under the gate

Photo by Theodore Leslie Shear

RUINS OF THE GREEK THEATER AT LINDOS, CUT IN THE SOLID ROCK OF THE HILLSIDE: ISLAND OF RHODES

In ancient times there were important schools of philosophy, art, and oratory in Rhodes, the latter having been attended by Cicero and Cæsar. Rhodes has always been famous for its climate. A friend of Cicero visited the island in the year 44 B. C. and wrote the great orator that he would like to spend the rest of his life there.

Photo by Ernest L. Harris

INTERIOR OF A GREEK CHURCH ON THE ISLAND OF RHODES

The liberty granted the people of Rhodes by the Sultan Suleiman allowed many excellent Greek churches and schools to be built. The conquest of Rhodes by Italy has brought the eastern and western churches back into close proximity once again

water to the underground aqueduct in ancient times. I stopped for the night in a Greek cloister in that same valley, the priests doing everything in their power to entertain me.

With fish fresh from the sea, with figs just pulled from the trees, with melons, grapes, and nuts which had ripened and found their flavor beneath a Samian sun, we had a festive board which might rival the splendid feast given by Edmond Dantes in the fabled grotto on the isle of Monte Christo.

Toward sunset one evening I ascended to the top of the mountain above the cloister in order to obtain a beautiful view of the sea. There before me in the gloaming stood Mt. Mycale, dim and hoary, while the winding Meander flowed into the sea at its feet. The blue sea stretched away until it met the azure sky where Patmos stood, at an uncertain distance on the horizon, and the receding coast of Asia Minor extended away to the south until it became lost to view in the direction of ancient Halicarnassus. Immediately below, only a few miles distant from each other, are the scenes where two of the greatest naval engagements in ancient history were fought, namely, Lade and Mycale.

I have visited many times the scenes within reach of my field-glass from this point, and each time some new and lasting impression associated with the history of the past was left indelibly upon my memory.

With the aid of a powerful glass the plains of Miletus and Ephesus are brought into view, although the ancient cities lie several miles inland. In this connection I am reminded of the historian Freeman, who has said:

"The sum and substance of history's tale can be heard in its fulness only on the spot which is its home. One must put rein on ten thousand memories, on ten thousand points of deathless history, every one of which become ten thousand times more living as we see them written forever on the everlasting page of the soil, the hills, and the sea."

Samos, like Chios, is the home of windmills. They are scattered everywhere along the roadside in the interior of the island, and they certainly are an asset as far as picturesqueness and interest are concerned. The two greatest industries of the island are the manufacture of cigarettes and the making of wine. Both are shipped to every part of the world.

CIGARETTES FOR KOREA

While standing on the quay at Vathy I saw cases of cigarettes destined for Korea. The wine is largely shipped to Europe, where it is used chiefly for mixing purposes. In the summer time the harbors of the little island also offer good sport in yachting and fishing. The "chipouri" and "laveraki" of these waters have been famous ever since one of them swallowed the ring of Polycrates. Sea bathing at Samos from June to September is simply perfect. The yachting is excellent, but the treacherous winds which suddenly arise after a dead calm admonish one to exercise care. The pilot of the *Violet* was knocked into the sea by the boom once on account of the unexpected shifting of the wind. He managed to grasp the dingey which was being towed astern, and even this frail craft capsized before we managed to get the half-drowned man aboard.

The history of Samos since 1912 has been eventful. In April of that year, while the Tripolitan war was still in progress, two Italian ships of war entered the harbor of Vathy and torpedoed the small Turkish "stationaire" which had been kept there at the disposal of the prince. During the Balkan war the little garrison of a few hundred Turks was compelled by insurgents, Samians and Cretans, to retire to Smyrna. At the close of the war the Samians issued a manifesto declaring their union with Greece.

THE ISLAND OF RHODES

"I have seen each distinct and separate place
Where stood the Seven Wonders of the world;
Their faded glories I have sought to trace
Where once their pagan banners were unfurled.
All! all are gone, and nothing now is left
Save outward tokens of a deep decline;
These ancient shrines have sadly been bereft
And scattered to the winds of every clime."

The history of the island of Rhodes may be divided into three periods, namely,

from the earliest times to the days when it became a Roman possession; from the beginning of the Christian era to the establishment of the order of the Knights of St. John on the island; and, lastly, from the fourteenth century to the present time.

What Wisby was to the Baltic in the thirteenth century A. D., Rhodes was to the Mediterranean about 300 B. C. Owing to its favorable location on the great highway between Egypt and Greece, the island early rose to commercial importance. Its first settlers were the Dorians. The people were thrifty and skilled in handiwork, and they soon built up an extensive fleet, which not only enabled them to gain important possessions along the adjacent coast of Caria, on the mainland of Asia Minor, but they were also in a position to become the masters of the eastern Mediterranean as well. There were important schools of philosophy, art, and oratory, the latter having been attended by Cicero and Cæsar.

THE DAYS OF THE KNIGHTS

With the advent of the Knights of St. John an interesting period began for Rhodes. This order was founded in Jerusalem in the eleventh century, and after many hardships finally found a home at Rhodes, where it assumed the name of the Knights of Rhodes. The power of the order was also gradually extended over a number of the smaller neighboring islands, as well as the coast of the mainland. Such a prosperous island early attracted the attention of the Turks, and after many wars the Knights were finally forced, in 1522, to retire to Malta.

From this time until the war with Tripoli, Rhodes was under Turkish rule. In May, 1912, an Italian fleet landed a force on the island and in a short time compelled the small Turkish garrison to capitulate. At the present time the island is being held by Italy.

The most interesting things to be seen in Rhodes are the walls and buildings connected with the days when the Knights ruled on the island. The walls, in fact, may be classed among the finest monuments of medieval architecture now extant; the towers and bastions are, for the most part, in a state of splendid preservation, and the whole is surrounded by immense moats. In many of these moats huge cannon-balls have been piled up as a grim reminder of the fierce sieges which these walls have withstood.

The so-called Street of Knights remains about the same as it was in the fifteenth century. The arms of the various orders are engraved on many of the houses, some of which are occupied by Moslems today, and the windows have been somewhat disfigured by lattice-work which has been placed there in order to conceal the women of the harems.

THE COLOSSUS DESTROYED

Every vestige has disappeared of the Colossus of Rhodes, the great bronze statue in honor of the god Helios erected at Lindus in 285 B. C. This statue stood 112 feet high and was known as one of the Seven Wonders of the ancient world. Many place the ancient site on a narrow strip of land which extends into the sea at the entrance of the harbor—that is, the point which today is surmounted by Fort St. Nicolaus—while others claim that it stood well within the harbor. After standing for only 56 years it was hurled down by an earthquake, and after lying about the ground for nearly 900 years the fragments, consisting chiefly of bronze, were sold to a Jew at Homs, in Syria. It is claimed that 900 camels, in a single train, were employed to bring it to that town, a distance by land of at least 500 miles.

According to an Italian census of the city of Rhodes taken in 1913, the population numbered 13,744; namely, 4,890 Moslems, 4,290 Jews, and 3,564 Greeks, making practically an equal division among the three nationalities. The Jews and Moslems are crowded, for the most part, within the walls, while the Greeks are spread around among the little suburban villages.

The Jews form an interesting part of the population, and in many instances are as typical of this race as can be found in any place in the East. While retaining their religion in every respect, they have adopted the manners, habits, and mode

Photo by Ernest L. Harris

THE INNER HARBOR OF ADALIA FROM THE ANCIENT WALLS: SOUTHERN ASIA MINOR

"On the southern coast of Asia Minor, in a far corner of the Gulf of Adalia, is situated the picturesque modern town of Adalia. Few towns in Turkey can vie with it in real genuine interest from the viewpoint of presenting to the stranger a deep insight into the habits and customs of the people" (see text, page 258).

of living of the Turks. This also applies to their dress, and the interior of their households can scarcely be distinguished from those of the Moslems. Only the Jewish women go about unveiled.

The young girls wear a costume native to the island, and the most of them are bright and attractive in their appearance and manners. I saw one of these girls wearing a string of 20-dollar gold pieces around her neck worth several hundred dollars. She told me that her sweetheart had gone to America a few years before and had sent them to her from time to time as a present. After the proclamation of the Turkish constitution, in July, 1908, many of the Jews emigrated to America.

I made an excursion along the coast to the ancient site of Ialysos, which was one of the earliest Dorian settlements on the island. Few Hellenic remains are left to tell the tale. The rewards of this journey, however, lie chiefly in seeing something of the country people of the island, who are for the most part Greek.

The Greek schools and churches are very good, considering the fact that the people practically live from hand to mouth. Farming methods are wholly primitive. The ancient plan of irrigating from wells is still in vogue. The water is lifted and poured into ditches which lead from the well in different directions over a field.

The climate of Rhodes is splendid, and the island is sought by many as a summer resort. The bathing is excellent, and a fairly good hotel has been built for the accommodation of strangers. The commerce of the island consists chiefly in an export trade in fruit and vegetables.

A FEAST IN LYCIA

Whoever makes the trip by steamer from Rhodes to Adalia by clear weather has added a chapter to his experiences which will undoubtedly be classed among the fondest recollections of later life. To the right lies the broad expanse of the Mediterranean stretching away to the shores of Palestine and Africa, while to

the left the snow-capped mountains of ancient Lycia pierce the azure blue of the firmament. The scene is varied by a changing view of immense precipices over which plunge thundering torrents of melted snow into deep gorges, cut into the lower hills which separate the higher ranges from the plain and sea.

Situated not far from the coast is the site of ancient Xanthus, a city full of celebrity in days gone by. The ruins are situated on the river Xanthus, mentioned in the songs of Homer. Under the reign of Cyrus a Persian army stormed and carried the city, but the inhabitants preferred death to bondage and nearly all perished at the hands of the conquerors. This calamity was repeated by Brutus after he had murdered Cæsar, the people of Xanthus again preferring death to subjugation.

A stay at Fineka enables one to study the life and customs of the natives in a section of Asia Minor seldom visited by a stranger. Everything is primitive, and, with the exception of a few large estate owners, the people are wretchedly poor. They live in miserable huts, which neither keep out the cold of winter nor the heat of summer. Another thing I noticed in this section was the large number of genuine African negroes who have lived and intermarried with the Turks for generations past. They were all Moslems in religion and there was absolutely no distinction made among them as far as race and color were concerned.

A WAYSIDE LUNCH

I stopped one day for lunch in a large estate near the ruins of Limyra. The place was surrounded by a grove of orange and lemon trees, which afforded cool shade from a hot June sun. My host was a genuinely hospitable Turk and the lunch was served according to the customs of the country.

We all sat down on a large straw mat in the center of a room which, for furniture, could boast only of a bench around the side and a few Turkish framed inscriptions on the walls. We squatted down indiscriminately—pasha, donkey-drivers, and peasants—forming a large circle, in the center of which was placed a big tureen of boiling rice soup, from whose top extended ten wooden ladles or spoons.

This soup was not served on smaller plates, but each leaned forward and helped himself from the tureen at every mouthful.

A whole boiled chicken was then passed around by an attendant and we satisfied our hunger by pulling off a leg or a wing, as occasion suggested. Some of these Turkish dishes are excellent, however, no matter how crudely they may be served.

And when you are living in camp and in the saddle the Turkish way of serving meals quite appeals to you. This particular lunch in question was typical in every respect, and further courses of pilaff and jaghurt, with oranges fresh from the trees for desert, as well as genuine Turkish coffee and cigarettes, made us all ready for the siesta which invariably follows in this part of the world.

PICTURESQUE ADALIA

On the southern coast of Asia Minor, in a far corner of the Gulf of Adalia, is situated the picturesque modern town of Adalia. Few towns in Turkey can vie with it in real genuine interest from the viewpoint of presenting to the stranger a deep insight into the habits and customs of the people. The harbor itself is small but deep, and only little coasting steamers can anchor well in toward the quay.

The town has been built upon a cliff 120 feet high, which commands the sea and over which tumble innumerable streams of clear, cold water that have their sources far up among the distant snow-clad mountains. These streams serve at the same time to irrigate magnificent orchards of figs, pears, and mandarins.

One sees in every part of Adalia pieces of ancient sculptures used as adornments in the walls, street corners, doorways, courtyards, and fountains. About the only antiquity, however, that has retained its original position is the splendid wall, which had been preserved almost in its entirety, although belonging to different epochs of history, and which has naturally been patched and repaired frequently during the hundreds of years of

A VIEW OF THE SPLENDIDLY PRESERVED WALLS AROUND THE CITY OF ADALIA: SOUTHERN ASIA MINOR

This wall in many respects is similar to the one at Wisby, on the island of Gotland, in the Baltic Sea. Though patched and repaired frequently during the hundreds of years of its existence, it has been preserved almost in its entirety.

Photos by Ernest L. Harris

ANOTHER SCENE IN THE TOWN OF ADALIA, SHOWING THE ANCIENT WALLS EXCELLENTLY PRESERVED: SOUTHERN ASIA MINOR

"The town has been built upon a cliff 120 feet high, which commands the sea and over which tumble innumerable streams of clear cold water that have their source far up among the distant snow-clad mountains" (see text, page 258).

SILK CULTURE AT ADALIA, IN ASIA MINOR, SHOWING COCOONS

"Adalia has a considerable silk industry, the climate of this section being conducive to the growth of the mulberry tree. The cocoon sheds are erected outside the city limits" (see text, page 261).

Photos by Ernest L. Harris

AMONG THE SILK WORKERS AT ADALIA: SOUTHEASTERN ASIA MINOR

"In some places the streets of Adalia are very narrow, and the balconies of many of the houses project outward one above the other to such an extent that two persons can almost join hands across the street from the upper stories" (see text, page 261).

THE MOREATES OF ADALIA, ASIA MINOR Photo by Ernest L. Harris

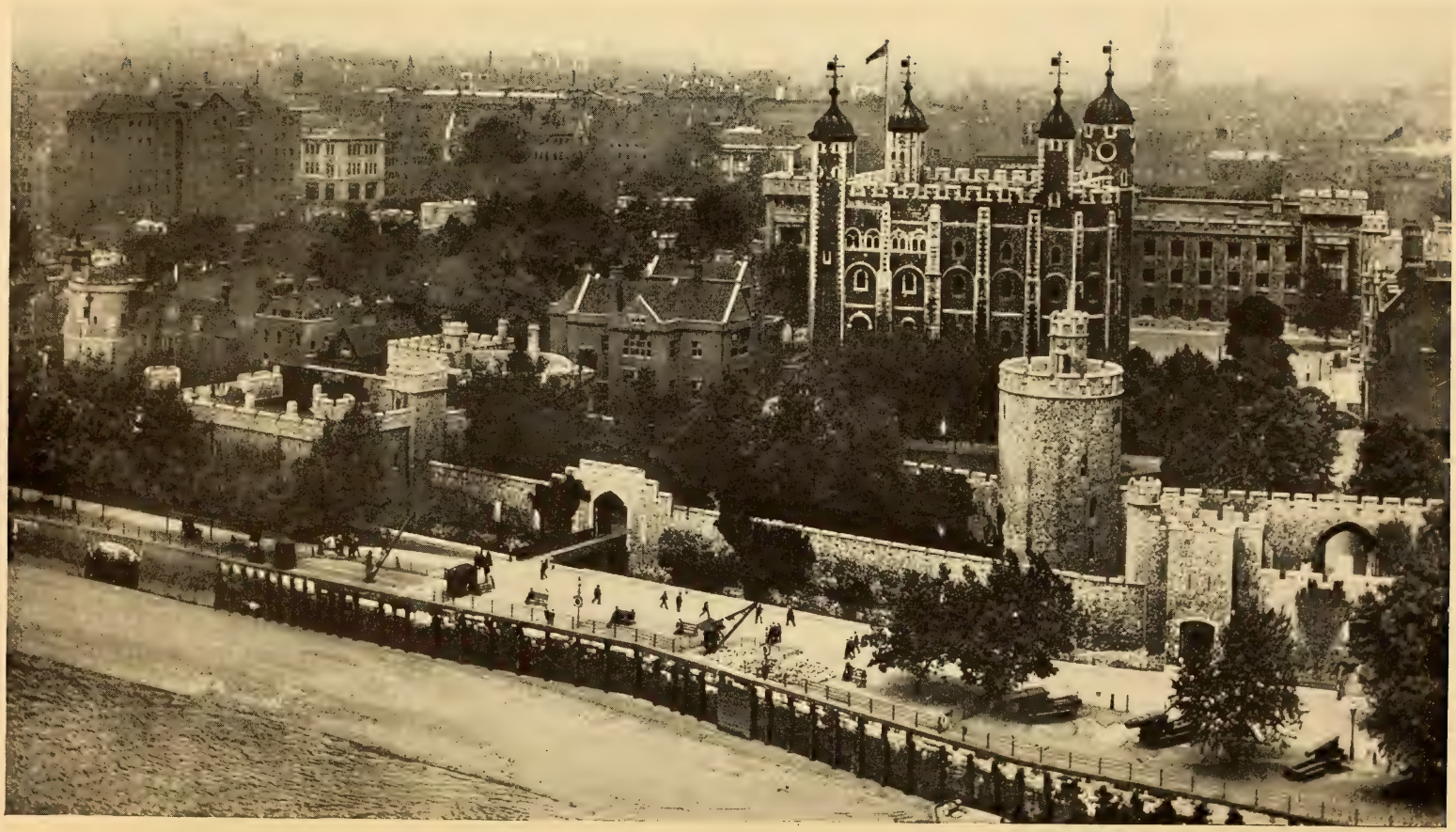
A most interesting tribe of people living at Adalia are the Moreates. Their ancestors left Greece after the revolution, and, with the exception of their religion, they have become Turks in manners and customs.

its existence. The wall around Adalia is similar in many respects to the one at Wisby, on the island of Gotland, in the Baltic Sea.

Adalia is noted for its dancing dervishes. Greeks of this section have lived so exclusively among themselves for generations that they have retained many ancient habits of their race. This is also true of the Jews who reside here. The bazars and mosques are also extremely interesting, inasmuch as they have retained their distinctly Turkish character since medieval times. In some places the streets are very narrow, and the balconies of many of the houses project outward one above the other to such an extent that two persons can almost join hands across the street from the upper stories. In this respect many of the streets of Adalia remind me of similar streets in Brunswick, Germany.

Adalia also has a considerable silk industry, as the climate of this section is conducive to the growth of the mulberry tree. The cocoon sheds are erected outside the city limits and are interesting, for the reason that the laborers employed are made up of the different nationalities residing in this district.

The islands of the Ægean taken together constitute one of the most historic and interesting insular regions in the world. Besides the twenty principal ones, which have lent much to history, there are innumerable smaller ones. Eubœa, the largest of all, lies close to the seacoast of Greece; Thasos borders the Macedonian coast; Samothrace lies near the Gulf of Saros, while Imbros and Lemnos are prolongations of the Gallipoli Peninsula. The northern Sporades include Sciathos, Scopeles, Haloneses, and Scyros, with its group of small islands. Chios, Samos, Nikria, Cos, and Calymnos lie along the west coast of Asia Minor. Andros, Tenos, Naxos, and Paros belong to the great group of the Cyclades, of which they are the largest. Many of the Ægean islands are actually prolongations of promontories jutting out from the mainland. Some of them are of volcanic formation. The larger islands have a number of fertile and well-watered valleys and plains, the principal products of which are wheat, wine, oil, mastic, cotton, silk, raisins, honey, and wax. Coral and sponge fisheries are numerous, and in most of the islands the ancient Greek type perseveres among the people.



THE TOWER OF LONDON

Viewed from the approach to Tower Bridge, the Tower of London today tells little of the tragedies enacted there in centuries agone. First a palace, then a fortress, it became a state prison, where many an illustrious head fell into a guillotine basket. Today it is a government arsenal, where are housed alike the royal regalia and war munitions.

LONDON

By Florence Craig Albrecht

Illustrations from photographs by Emil Poole Albrecht

THERE are so many Londons in one London, where begin with them? The London of Roman and Saxon, of Norman and Plantagenet; the London of Chaucer and Shakespeare, of Lamb and Dickens and Thackeray; the London of clubs and hotels; the London of factories and sweat-shops; the London that administers the affairs of empire, and the London that dances and plays cricket. There is the summer London of the tourist; there is social London revelling in May; there is the November London of smoke and fog, busy and inhospitable; there is today a darkened London, somewhat apprehensive, but grimly determined, a London different from any we have known. They are each London, and all London—the greatest city in the world.

THE WORLD'S GREAT CITY

Older capital cities than London there are a few in Europe, greater there are none. Putting aside all unproven tradition, its history begins with the coming of the Roman legions. Rome, seven centuries old, was in her pagan prime, but Paris, then Lutetia, was an island hamlet in the Seine; Vienna was a small Roman camp; Berlin did not come into existence for many a century thereafter; Madrid first appears a thousand years later; Brussels was founded in the sixth century, Amsterdam about the 13th of our era. These count not at all in London's age.

And while we are busy with figures let us give a few more and have done.

The city of London, the commercial heart of the metropolis on the site of British hamlet and Roman town, measures about a mile square. In the daytime its inhabitants number more than 300,000; at night not a twelfth that number sleep there—land is too valuable for residence. During one day a million and a half of people pass through its gates. Beyond it and across the river spreads another London, of five million people, over 130 square miles (approximately 14 x 10 miles), and beyond that "Greater London," the district covered by the Metropolitan and city police, with 700 square miles and more than seven million inhabitants.

SIDELIGHTS ON ITS SIZE

Her streets, straightened and laid end to end, would reach from New York to San Francisco. Of her 650,000 buildings, 500 are hotels and inns. One hundred thousand Americans pass through them in peaceful summers and 15,000 resided there before the war. It is a common saying that "there are more Scotsmen in London than in Aberdeen, more Irish than in Dublin, more Jews than in Palestine, and more Roman Catholics than in Rome." That surprises us less than it does Europeans; it might also be true of New York. London's foreign population concerns us very little, nor does the East End now surprise.

The East End, beyond the "city" and the Tower, is a manufacturing district, tenanted largely by Jewish tailors. There are other industries, but the race predominates. The West End is the home of fashion and of power. Its residents are not true Londoners, although they would resent the assertion; they are sojourners for a more or less brief time. Between these ends lies real London—all the year, every day, native London—with all its wealth of long and tremendous history, of literary and legal repute, of commercial prestige, of architectural fame. The district across the river concerns the American visitor only in a few definite interests; all of London for him lies in a mile-wide band along the Thames, from the Tower to Westminster; but so rich is it that when he would summarize his impressions, he finds neither beginning nor end.

THE FIRE MONUMENT: LONDON

This Doric column was erected by Sir Christopher Wren to commemorate the great fire of London in 1666, which commenced near by, in Pudding Lane, and destroyed 13,000 houses and 89 churches. Splendid views of London are to be obtained from the landing near the top.

A LOVER OF LONDON

Once an American went to England as to his childhood's home. He carried to it an inheritance of memories, a ready sympathy; it offered to him a certain strangeness, yet a sweet familiarity that puzzled and enthralled. Today so many of our fellow-citizens look to Germany, Poland, Switzerland, Italy, Russia, or France as their forefathers' home, it cannot be true; yet wherever the English tongue is spoken, wherever English history is known and English literature read, there is a constant preparation for the assured treading of London pavements, for enthusiastic recognition of revered spots and deeds and names. I think it is Mr. Howells who says, "You may not like London, but you must love it." I quite agree, and because I love it and because one hesitates to speak of those one loves, fearing to say too much or yet too little, I cannot come to any clear description.

In the days when I was so young that I thought myself quite, quite old, I lived for many months in a hotel that looked down upon High Holborn just where Chancery Lane opens. It is not a location that any tourist would choose today. I am not sure that he would have done so then. I was not a tourist. There were reasons why I should be there and I was there.

A NEW HIGH HOLBORN

I do not recall the motive, whether I or some one was ill, or if it was merely the call of the summer night; but I remember very clearly leaning with folded arms upon the broad, low window seat, far out over the silent street, at some hour just before the dawn of a June day. Always, when I had seen it, that street had been a tangle of omnibuses, hansoms, bicycles, drays, carts, and wagons struggling to or from the "city," twisting in and out of Chancery Lane. Always the air had been filled with cries—vendors, newsboys, teamsters—loudest of all those of the rival 'bus lines: "Chipside or Bink! Penny all the wye! Penny all the wye! Chipside or Bink! Bink! Bink!" No matter how late I had gone to bed, the hubbub of voices, feet, and wheels had come to my window.

This time the street was still. Under the light on the corner stood a policeman, quiet but alert; in the shadow of a doorway slouched a figure, not a policeman, also quiet. Idly I watched them both, and in the silence there came to my ears the sound as of a great distant waterfall or of a well-oiled, contented dynamo. It rose and fell gently in the summer night—a deep, full note, softly trilled. I have heard it many times since that night; heard it from a window opening on Trafalgar Square; from a balcony in Mayfair; a terrace by the river; listened for it deliberately then and at other hours and in other cities. The noises of the day overlie it as the treble covers the pedal notes of an organ, but it is there. I do not find it in other places—Paris, Philadelphia, New York, or Rome. Night noises there are, but each distinct—the whistle of a boat on the river, the rumble of a train, the hoot of a motor-car. This, however, is not noise; it is a drone—the combined whirring and buzzing of many wheels and men toiling while the city sleeps.

ECHOES OF THE PAST

And for those who have ears to hear, it is more than that. It is the tramp of Roman legions investing a squalid British hamlet; it is the battle-cry of Saxon and of Dane; it is the shout of the Norman conqueror, the echoes of the mallets of his builders; it is the gay songs of courtiers riding to this or that palace on the Thames; it is the chant of many psalms, the sob of martyrs; it is the thud of oars in muffled rowlocks, as a barge slips down the river from the judgment hall of Westminster to the Traitor's Gate at the Tower. It is the laughter of masques and revels in inns of court halls and gardens; it is the moan when a king dies by Whitehall; it is the frenzy born of plague and of fire; it is the babble and yells of roisterers, the drone of nuns; it is the acclaim of a new prince and a new crown. It is all these and more—it is the throbbing of a city's heart; it is the voice of many peoples through two thousand years.

THE RIVER THAMES, THE TOWER, AND THE TOWER BRIDGE: LONDON

No river of its size in the world is spanned by so many bridges within the limits of a single city as the Thames, there being fourteen of them within the county of London alone. In spite of the relief afforded by the Tower Bridge, opened in 1894, London Bridge carries 22,000 vehicles and about 110,000 pedestrians every day. The part of the river below the Tower Bridge is the busiest part of the dock region of London.

ST. PAUL'S CATHEDRAL AND THE RIVER THAMES: LONDON

"The grouping of the city's parish churches about St. Paul's, the contrast of their delicate, graceful spires with the huge brooding dome, is perfect"
(see text, page 269)

THE BANK OF ENGLAND AND ROYAL EXCHANGE: LONDON

The exterior walls of the Bank of England are entirely devoid of windows, the bank being, for the sake of safety, lighted from interior courts. It is the only bank in London with the power of issuing money. About a thousand people are employed within its walls, and its vaults contain in normal times about one hundred million dollars' worth of gold and silver. The weighing office contains machines which weigh sovereigns at the rate of thirty-three per minute, throwing those of full weight into one compartment and the light ones into another. Half a million dollars' worth of gold is thus tested daily.

It does not come directly from the "city," yet the "city" is responsible for it—the little ancient city, where the Lord Mayor rules, in the medieval splendor of velvet and fur and lace when he goes on the 9th of November to take oath of office in his great golden chariot, all bobbing and quivering on its huge springs with the weight of his magnificence, and in the dress of an English gentleman all the other days of the year. This is the city built on the site of Briton hamlet, Roman camp, Saxon stronghold; the city which has been ravaged by plague and by fire, repopulated and rebuilt almost over night. Of the Roman city which ended with the recall of the legions (412), there remain large fragments of wall, the names of gates, sundry relics of edifices. The Saxons and the Danes were not builders, but of Norman London there is yet that stately Tower, historically the most interesting spot in England, and at the other end of the city, Temple Church. The "great fire" of 1666 took what stood between; for what is there today Sir Christopher Wren is largely responsible.

AN ARCHITECT'S OPPORTUNITY

Surely, to no architect ever came greater opportunity. This fire, of which our voluble friend Pepys gives such graphic account—"the churches, houses, and all on fire and a horrid noise the flames made; . . . it made me weep to see it"—licked up 13,000 houses and 89 churches, among them the ancient Cathedral of St. Paul. Wren drew the plans for their reconstruction; he and his pupils carried them to completion. In the general scheme none could have wrought better. The grouping of the city's parish churches about St. Paul's, the contrast of their delicate, graceful spires with the huge brooding dome, is perfect. For two thousand years a sanctuary of some sort crowned this low hill; for six hundred a huge and stately church, which, if old prints speak true, was lovely indeed to look upon—a Gothic church which fitted a northern city and northern sky as Italian St. Paul's does not.

As a hall of fame, however, the cathedral is appropriate. What a place of pilgrimage it must be today! Here England enshrines or commemorates her soldier and sailor sons; Nelson and Wellington head the list; also her great painters—Turner, Landseer, Leighton.

MEANT FOR LARGER SPACES

Some of the monuments are good and more are bad—very bad. After suffering the many criticisms on America's poor taste in art one is sure to endure in the house of one's friend, it is a wicked satisfaction to lead one's tormentor into St. Paul's and halt casually before one of these atrocities. There is a moment of eloquent silence, then an explosive "Hum! let's have luncheon!"

St. Paul's from the river is delightful; it was meant for large spaces. By the maze of tiny streets about it, it is too crowded; but their names and associations are a never-ending pleasure—Paternoster Row, Ivy Lane, Amen Court, Bell Yard, Queen's Head—and between it and the Tower are many things at which a tourist should look. The monument on Fish Street Hill, for instance, commemorating the "great fire"—a fluted column whose height precisely equals its distance from the house of the King's baker in Pudding Lane, where the blaze began. Then there is the "London Stone," built in the wall of the Church of St. Swithin, an old Roman milestone, the milliarium of the Roman Forum, whence British highroads were measured. What a "modern" is Wren after all!

IN LONDON TOWER

There is no question of our reverence for the Tower. I'm not sure that its museums have much interest for us, although we have plodded dutifully through them more than once, hoping for thrills. The Crown jewels left us quite indifferent; shop windows are so gay nowadays! And there was so much of the armor. The charm of the Tower is not what it possesses; it is what it is and has been.

Certainly there was a fortress here in Roman times, on this little hill among the marshes by the river, and in Saxon days a great stronghold. But when William the Conqueror gave its first charter to the little city of London, "to William the Bishop and Gosfrith the Portreeve,"

Photo by F. J. Koch

A LONDON POLICEMAN

With an area equivalent to that of a strip of country a mile wide reaching from New York to Chicago, it is to be expected that Greater London has a larger police force than any other municipality in the world.

THE LORD MAYOR OF LONDON'S COACHMAN

It is a sight to see the Lord Mayor in his medieval splendor of velvet and fur and lace when he goes, on the 9th of November, to take the oath of office in his great golden chariot, all bobbing and quivering on its huge springs with the weight of his magnificence.

Photo by F. J. Koch

WHEN THE KING GOES ABROAD

When the King leaves his house on state occasions a double guard is drawn up—the interior guard made up of Royal Fusiliers and the outer of plain London "bobbies"

he evidently doubted its fidelity. He pulled down a bit of its eastern wall and even encroached upon its territory to make room for his great White Tower, the keep of the huge fortress, the most picturesque building in the Tower of today. London did not like it very well. Sentries on the Tower or wall could look right down upon the mean little wooden houses, the thatched roofs, the narrow, dirty streets of the Saxon town; could check the least uprising ere it had well begun. But what could London do but endure! If a threat, the Tower was also an inspiration. Under Norman rule, wooden London became stone London, a feat greatly aided by the fire of 1077, "a fire such as never was before since London was founded," which cleared the ground.

PALACE, PRISON, ARSENAL

The Tower — the whole fortress is called that, never "castle," for some reason unexplained—is today vastly different from that of the Normans. Then it was a royal residence as well as a stronghold; now it is a government arsenal and barracks. Its 13 acres are yet ringed with the double walls of the Normans, strengthened by many towers, and the moat, now all soft, sunny turf fit for tennis courts, could be flooded at need. There are several huge modern barracks in the enclosure, officers' quarters and guardhouse, the equipment of a fairly efficient fortress; but, unthinking of wars to come, we have always seen it with eyes turned toward the past. It is as a state prison that history knows it best; therein lies its greatest interest.

The White Tower has its name from nothing more poetic than whitewash spread upon it in 1240. It is 107 x 118 feet, 92 feet high, and its walls are 13 feet thick at their thinnest. Sir Christopher Wren "restored" it and altered four of its Norman windows to a "classical"

Photo by F. J. Koch

A STUDENT: LONDON

London fogs and the smoke nuisance are not of recent origin. In 1806 the people petitioned Edward I to put an end to the smoke nuisance and he promptly made it a capital crime to use sea coal for domestic purposes. But London smoke still persists.

formula. One wishes he had not. It matters the less here, however; the interest is in people, not places. So much history has been made here, so much suffering endured, so much hope and happiness ended. Down to the time of Charles II the court frequently resided here—in a building now gone. Little children were born here; others died.

THE FATEFUL WATER-GATE

It is not so much these who twist our heartstrings; it is those who came in state barges by the water-gate to leave no more. Doubtless some deserved their fate; not all were innocent and good; but the burden of their sorrow is upon us. Sir Thomas More, Anne Boleyn, Catharine Howard, Lord Somerset, Lady Jane Grey and her husband—all died either here or upon the scaffold on Tower Hill and are buried in the sad little church of St. Peter ad Vincula, within the walls—the saddest little church and graveyard possible, for here were buried not only youth and life and love, but faith and honor.

Sir Walter Raleigh was imprisoned here; the little sons of Edward IV were murdered here; the Duke of Clarence died in his butt of malmsey in one of these many towers. But others there were more fortunate, as Arabella Stuart and the Princess (afterward Queen) Elizabeth, who came out once more to life and freedom. And now, having made ourselves as cheerfully sad as possible, let us go out on the embankment, which now

Photo by Emil P. Albrecht

THE GUARDIAN OF THE TEMPLE: LONDON

The uniformed gentleman is vociferously informing the photographer that he is a trespasser upon private property, the grounds of the Temple being open only to barristers and servitors of this inn of court, except upon such occasions as the Temple shall decree. The inns of court are societies for the study of law and possess exclusively the privilege of calling to the bar. There are four—the Inner and Middle Temple, Lincoln's Inn, and Gray's Inn. The Temple was formerly a lodge of the Knights Templar, became Crown property upon dissolution of the order in 1313, and after several changes came into the possession of the Knights of St. John, who leased it in 1346 to the students of common law. From that day the group of buildings between the Thames and Fleet street has been a law school.

lies between Tower and river, or, better yet, on the stately Tower Bridge, to look back upon the ancient pile. We may well spare the Beefeaters, the picturesquely attired warders, a passing glance; they and the Lord Mayor preserve for us medieval London. Serious-minded people derive their title from Buffetier—servers at the King's buffet—but the frivolous incline to the letter of the word; part of their wage was anciently paid in sirloins of beef. They are all old soldiers of meritorious service, these Beefeaters, and are very prominent in city processions and coronation festivities. For this service they receive medals, which they wear proudly.

"I WAS 'ORRID 'OT"

Said a friend of mine to a very ancient Beefeater who had served at two coronations, "What do you think about when

Photo by F. J. Koch

ADVERTISING TO THE EYE AND NOT TO THE EAR

Newsboys in London are not allowed to call their papers. They stand silently and advertise the contents of their papers by placards like these

you walk in that fine procession? You must feel very proud indeed." The every-day garb of the Beefeaters is as comfortable as it is quaint, but the dress uniform is very Elizabethan in picturesque discomfort. "Proud is it? Proud? Not I! What I thinked of when the King was a-crowning was that I was 'orrid 'ot, and the blawsted ruff made my whiskers tickle my nose till I was like to sneeze."

Now, after we have looked our fill at the old White Tower, have pondered long the full meaning of Traitor's Gate, let us take boat—they are not especially fine boats, and on holidays are apt to be crowded, but we shall go on a Monday and make the best of them — to that stately hall at Westminster which supplements this Tower. It is hard indeed to turn our back upon the port—such a port—and there will be much temptation to disembark by the way. Not at Billingsgate, certainly, redolent of fish and language too forcible to be fine; nor, indeed, anywhere in the city until we come to the Temple, at its farther end.

KNIGHTS TEMPLARS' HOME

Here, in a pleasant place beside the city, its gates opening upon the river road that connected St. Paul's with Westminster (Fleet street and the Strand), whose flowery gardens dipped down softly to the sedgy river, the powerful order of Knights Templar—"poor soldiers of the Temple of Solomon"—made their home. After the suppression of the order, in 1313, the property passed to the Crown and ultimately to the Knights of St. John, who leased it to the "students of the common law," in whose hands it remains to this day.

Of the ancient buildings only the round Norman church of 1185 remains, one of the few in England. In it peaceful mar-

FLEET STREET (FROM LUDGATE CIRCUS) : LONDON

The street is famed for its newspaper offices. It is one of the busiest thoroughfares in the world. When the reigning sovereign visits the city on state occasions, he never fails to observe the ancient custom of obtaining from the Lord Mayor permission to pass Temple Bar.

WINDSOR CASTLE, COUNTRY HOUSE OF THE KING

Windsor Castle is situated about twenty-five miles outside of the heart of London and is one of the finest royal residences in the world. The restoration, completed under Queen Victoria, cost $4,500,000. The city residence of the King is Buckingham Palace. The stables of the latter place house forty different turnouts for the royal family.

Photo by A. W. Cutler

TYPICAL SCENE AT A WAYSIDE POND ON SPANIARD'S ROAD, WHICH ADJOINS HAMPSTEAD HEATH, ON A HOLIDAY

The pond is only knee-deep, and all day long the boys scramble for pennies thrown in by good-natured bystanders

Photo by Emil P. Albrecht

TRAFALGAR SQUARE AND NELSON MONUMENT

This monument, a massive granite column 145 feet high, commemorates Lord Nelson's death at the Battle of Trafalgar, October 22, 1805, where the English fleet gained its great victory over the combined armaments of France and Spain. By this victory England's position as mistress of the seas was firmly established. It frustrated the purpose of Napoleon—who had at Boulogne an army of 172,000 infantry, 9,000 cavalry, and 2,413 transports—to invade England. The column is a copy of one of those in the Temple of Mars Ultor, at Rome, and is crowned with a statue of Nelson 17 feet high.

Photo by Emil P. Albrecht

ONE OF THE LIONS GUARDING THE NELSON MONUMENT: TRAFALGAR SQUARE, LONDON

London annually spends more money than Greece; its parks cover more territory than Dallas, Texas; its insane population is greater than the total population of Charleston, West Virginia; the paupers provided for every day are greater in number than the total population of Duluth, Minnesota; its children of school age exceed the combined populations of St. Louis and St. Paul; its army of school teachers is one-fifth as large as the standing army of the United States.

ble knights have slept these seven centuries with other revered dust that once bore well-known names.

Anciently, men in holy orders were sole practicers of English law, but somewhere about 1200 the clergy were restrained from acting in any but ecclesiastical courts. There resulted some awkwardness, and, a century later, we find the establishment of schools of common law in inns near to the courts of law at Westminster, to which "eager and apt" students from the provinces might be brought. In these inns of court and of chancery, corresponding to our colleges, the "earliest settled places for students of law," not only law and divinity were studied, but "dancing, singing, and instrumental music; so that these hostels, being nurseries or seminaries of court, were therefore called inns of court" (Fortescue).

WHERE BARRISTERS BEGIN

The inns of court exist, with small modifications, as they did six centuries ago. There is no priority among the four, and in all matters of common interest their benchers (masters of the bench, governors) meet jointly; but Middle Temple and Lincoln's Inn, Inner Temple and Gray's Inn, are felt to have closer alliance.

An inn of court consists of benchers, barristers, and students. The benchers are senior, usually distinguished members of the society and its governors. They may be twenty, as at Gray's Inn, or seventy, as in the Inner Temple. Their chief duties are the admission of candi-

Photo by F. J. Koch

SAILORS IN LONDON: LONDON IS ONE OF THE LARGEST PORTS OF ALL BRITAIN

dates and the calling to the bar of students, but they have practically unlimited powers in all that concerns the management of the inn.

Once called to the bar, by the payment of an annual fee of £1 to £5 or of a fixed sum upon admission, a barrister remains a member of his inn for life. He may resign, but if he does so loses all membership at the bar. The fees for a student vary, but a barrister's legal education will cost from £400 to £500 and take about three years—twelve terms. Solicitors who have been in active practice for at least five years may be called upon shorter terms.

WITNESSING HIS OWN PLAY

The dancing and singing lessons bore their fruits in the masques, revels, and plays given by the members of these inns of court in their halls or gardens. Thus at Gray's Inn, Shakespeare's Comedy of Errors had its first performance in 1594, and later a Masque of the Flowers, which was revived for the Queen's Jubilee, 1887. Twelfth Night was acted, possibly before Shakespeare himself, in the great Middle Temple Hall, which we can see from the river. All of the inns have pretty gardens. That of Lincoln's Inn was a famous duelling ground, and is now a great public square surrounded by houses bearing resonant names and, appropriately, the Royal College of Surgeons. It is best reached by a gateway in Chancery Lane—a gateway at which Ben Jonson was said to have labored, a trowel in one hand, a book in the other; but the pretty story has been squashed.

The Temple garden opens now and then at the will of the benchers.

WHEN THE BRITISH LION ROARED

Merrily I marched in one day in the years of my ignorance. "Hi, hi!" called a uniformed gentleman, but I kept on confidently, with not the least notion that I was Hi! However, he soon made it plain to me. Also that I was a trespasser upon private property; that the benchers were very pleasant gentlemen. who did open the gardens occasionally; that I should wait for their pleasure in that; that an application to the honorable secretary, etc.—in all of which time my companion industriously took pictures. When my persecutor was breathless, I mildly explained that I was going away the next day, 3,000 miles away, and could not wait for benchers. Whereupon—as for us has always been the case—the British lion roared his loudest to scare us, and, having reduced us to proper

Photo by F. J. Koch

OLD CURIOSITY SHOP: LONDON'S MOST FAMOUS LITERARY SHRINE

meekness, benignly purred; the gates were thrown open wide and we were bidden to enter.

The embankment parts the garden from the river today. The roses no longer tiptoe down to dip their dainty feet in the Thames, as perhaps they did when Plantagenet and Somerset plucked there those blossoms, white and red, that named a war.

Plantagenet:

If he suffer that I have pleaded truth,
From off this brier pluck a white rose with me.

Somerset:

Let him that is no coward, nor no flatterer.
But dare maintain the party of the truth,
Pluck a red rose from off this thorn with me.—(*Henry VI.*)

In the great, beautiful hall (1572) there, Shakespeare saw his plays, Queen Elizabeth dined, and, upon a table made from the wood of the Spanish Armada, signed the death warrant of Mary, Queen of Scots.

Let us go now up the river past Somerset House, on the site of a palace of that name begun in 1549 by the great protector, and the home of many queens. The present huge building, the "house of many windows" (3,600), houses many public offices—audit, inland revenue, probate registry, wills—and in a wing, King's College, a school of London University.

Let us go on past the Savoy Hotel, where, from 1245, stood the palace of Peter, Count of Savoy, uncle of Eleanor of Provence, who was the wife of Henry III and the mother of Edward I. King John of France died here in 1364; Chaucer was married in its chapel; John of Gaunt dwelt here for a space; Cromwell used it for conferences. There is left of it today but a chapel (1505) and the name. Is not that enough to hold us for a while, waiting for court barges and fair ladies that come, alas, no more?

Soon we come to Charing Cross bridge, where indeed we must alight. We have passed under four bridges since we left

Photo by A. W. Cutler

THE GIRAFFE AT THE LONDON ZOO HAS A FEW THINGS TO SAY TO HIS ADMIRERS

the Tower—London, Southwark, Blackfriars, and Waterloo—and if the time was close to sunset we must have loitered at the latter a quarter hour. Then, when the level light is brightening St. Paul's huge dome, swelling high above the dusky city; when the fairy spires of St. Bride, St. Clement, St. Mary are flushing to rose against a darkening sky; when the trees on the embankment stand like a great grill, pale gold on the summit, almost black in the shadows, before the stately buildings which reach into light behind them; when the river ripples softly on its silvery path to the sea and all the little boats scurry madly over its gleaming surface, their white wakes whiter, their black smoke blacker for its brightness; when the whole scene swims in palpitating misty light—violet and rose and amber; then truly there is nothing in Venice more suggestive or more fair.

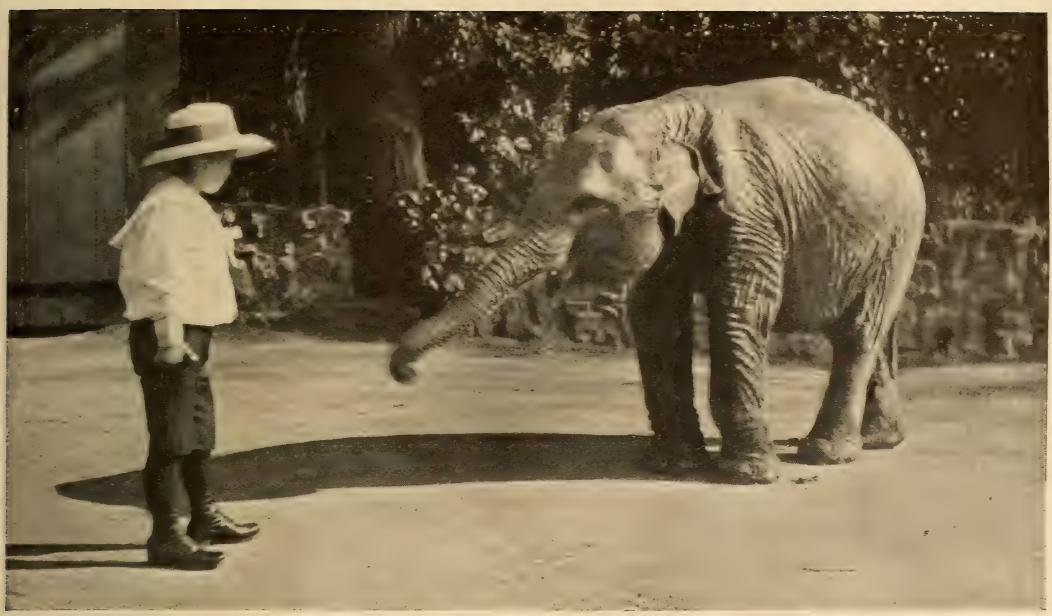


Photo by A. W. Cutler

AT THE LONDON ZOO

Baby Elephant: "Hurry up, kid, if you've got anything for me!"

But if it be a morning hour, we leave the boat at Charing Cross and go a-foot to Westminster, not by the embankment, but by Northumberland avenue and Whitehall. We will come thereby to Trafalgar Square, the official center, the tourist heart of London, and perhaps glimpse the beautiful cross in Charing Cross Station yard—that is, if taxis, motors, hansoms, paper "boys" and flower "girls" of all ages will let you think and see. The cross is but a replica, but it does credit "to the sweetest thought King ever had" and to a nation.

A KING'S SWEETEST THOUGHT

When, in 1290, Eleanor of Castile, wife of the first Edward, died at Harby, the long, slow funeral train started for Westminster. At each place where her bier rested for the night Edward raised a cross, and this, the stateliest of them all, stood here from 1291; the restoration is of our own time. Just why the bearers halted here within a half mile of the Abbey, when they had already tarried a night in the city, we can only surmise. There was an especially revered chapel here, and thence a stately entry could be made to the precincts of palaces and abbey; is that it? It has been a popular and pretty custom to derive Charing from chère reine, Edward's "dear queen;" but, like all prettinesses, historians will have none of it, claiming a village of Charing (Sax., Cerring) here between London and Westminster long before her time. But so Eleanor came to the Abbey and her beautiful tomb there, where she slept, let us hope, content, knowing herself remembered.

And now we may turn into Whitehall, the broad street named for an ancient palace where the business of the British Empire is administered—a very busy, very grave, street today, carrying the weight of war. The Admiralty, the Horse Guards, the Treasury, Downing street, the foreign and colonial offices are upon one side; great Scotland Yard, the War Offices, the "Banqueting Hall," sole relic of the Palace of Whitehall, on the other, and beyond, reached by Derby street, new Scotland Yard, headquarters of the Metropolitan police.

The Admiralty dates from 1722, but the larger part is quite modern; the War Offices are entirely so. The Government Offices, beyond the Treasury, are of 1868-1908, the Treasury of the time of George I. Here is the office of the Prime Minister (First Lord of the Treasury), and

THE HORSE GUARDS: WHITEHALL, LONDON

Great public interest is displayed in watching the Horse Guards on sentry duty outside the building. These soldiers wear a very handsome and picturesque uniform and are the tallest men in the British army

in Downing street, alongside a rather dingy dwelling—No. 10—is his "official residence," since 1731. No. 11 appertains to the Chancellor of the Exchequer.

WHERE WOLSEY LIVED

It was at Whitehall that Wolsey gave his sumptuous entertainments; here that he was publicly disgraced; here that Henry VIII first saw and coveted Anne Boleyn; here that he died. From Whitehall Elizabeth was borne by barge to the Traitor's Gate that she scorned to enter; here she returned out of captivity a triumphant queen; here Oliver Cromwell dwelt with his secretary, John Milton, and here he died; here Charles II lived recklessly and died nonchalantly. To it, from St. James Palace and his last night on earth, came Charles I, walking briskly across St. James Park, which was then the palace garden, and passed out through a window, marked today, to the scaffold where he would give his own signal to the executioner, "When I stretch my hands so—then—" Yes—Whitehall has long and heavy memories.

It was a huge place once. With its gardens it reached from Charing Cross to Westminster, from the Thames over St. James Park; but civil war and fire did their work; there is nothing of all its splendor but this hall of 1620. Let us pass on, then, to Westminster, which beckons in the mist; not the black fog of November that shuts out all things as with a curtain, but the soft, white, silky mist that smoothes rough edges, blends rude colors, makes prosaic things poetic and lovely ones sublime. And having come there, what shall one say? There is too much of beauty, of memory, of life and love and pain, too much of suggestion for one calmly to bear.

THE WESTMINSTER GROUP

Let us go across the river and look upon it all safely. The great Abbey Church is hidden now, so we can look the more critically: for the Houses of Parliament (the Palace of Westminster) are new—very new—for England, and do not oppress us with our own youthfulness. No one will question that they are beautiful. They spring from the river bank like delicate grasses, with here and there a stately, overtopping flower. It may be quite true that they are too elegant, too ethereal in their perpendicular gothic for appropriateness; that lawmakers of empire should have a sturdier, graver housing; it may be that if the Victoria Tower is correct, St. Stephen's is too slender; it may be that the river façade is overadorned; the statues of England's kings and queens wasted there. It may be all these things and more; I have no fault to find. The early morning light bathes the great whole in softest radiance; every pinnacle and tower gleams and laughs in sky and river; against the evening's glow they lie dusky violet, and the water ripples silvery past their feet.

Within they are as rich as without, but interest for us centers in that great Norman Hall, which we think the finest in the world. As early as the days of Canute there was a palace here, but it was William Rufus who, in 1097, began this hall, and a palace that was the residence of kings to the time of Henry VIII. The hall has served as House of Parliament, as a banqueting hall, as a court of justice; it has seen the making of much of England's history and the undoing of her kings. Coronation banquets were held here; captive kings were entertained here; knights bearing the King's challenge rode full armored into the hall; Charles I was here condemned to death, as were also William Wallace, champion of Scotch liberty, Sir Thomas More, Guy Fawkes, and many another; here Warren Hastings suffered his long and famous trial of seven years. Today the hall serves merely as a great vestibule to the House of Commons.

A SUPERB HALL

It is a superb place, 290 feet long, 68 feet wide, 92 feet to the oaken roof, which is quite unsupported by columns, a great clear, free space, mounting by some fine steps at the south end to the great window of St. Stephen's porch.

Outside this great hall one day we heard—or thought we did—the British Lion's growl. There is a dear jolly laughing lion by St. Stephen's porch, but it was not he; he is an old friend; we exchange grins whenever we go to salute Richard Cœur de Lion on his charger. We were sauntering along Old Palace Yard, looking back at Richard and for-

ward at the Victoria Tower, being photographically inclined, and halted to study the "finder." Out of nowhere appeared a "bobby" and jogged the photographer's elbow. "Beg pardon, ma'am, but you cahnt take that here, ma'am!" Visions of Scotland Yard and the Tower floated before my eyes. I gasped. It was a hot day anyway. "Go back there by that tree, ma'am, and you'll get it nicely, ma'am. I've got a box myself." Only a fellow-photographer after all!

WESTMINSTER ABBEY—THE HEART OF LONDON

The Victoria Tower rises above the King's entrance to the House of Lords. St. Stephen's Tower, at the other end of the long building (from St. Stephen's chapel), is the clock tower, the home of "Big Ben," the largest bell (13½ tons) in London except "Great Paul" (16 tons), which is the largest in England, in the cathedral tower. But "Big Ben's" smooth voice is heard all over London, and with its soft full pealing we come to the Abbey, which is, not geographically, but sentimentally, the core of London, the heart of her heart. We think of it less, in spite of its many and regular services, as a church than as a nation's walhalla, the shrine of her noblest and best, as the stage for stately ceremonial, as the reliquary which preserves history and poetry and art. Yet it is as a church that she endures through the centuries. The monuments that we revere and deplore are excrescences belonging neither to her service nor her adornment. They bring little to her; she gives much to them. Yet stripped of them all, though she would be the lovelier, she would be the poorer. She is today many things beside "that altar to the most high God and to the honor of His martyr, Saint Peter," with which she began.

Somewhere about 616, upon Thorney or Bramble Isle, a small marshy islet by the Thames, overgrown with thorns, surrounded by oozy water, a Saxon king built a church and monasterium, and as there was a Cistercian abbey or minster to the east of the city beyond the Tower, where the Royal Mint stands today, this became the minster of the west. It was a small affair apparently, although a splendid legend sends St. Peter to its consecration; but with Edward the Confessor (1049-'65) begins the history of the present great church, which was erected upon the site of Edward's in the latter half of the thirteenth century, practically as it is today. The superb chapel at the east end was built by Henry VII (1502-'20); there is nothing of its kind (a florid perpendicular) lovelier.

The interior of the abbey is doubtless open to criticism. The monuments are too many and often ugly; the choir is too long, usurping part of the nave; the screen is ugly; there are incongruities. And yet, though one fears to move in the duskiness for fear of treading upon sacred dust, one's eyes stray upward and away to the lofty, pointed arches, to the great perspective of nave and choir and transept; to the many chapels circling adoringly about the sanctuary, as they so often do in France, but rarely in England; and one hears in the stillness the hushed tread of processions, breathes the acrid odor of incense, senses the far-away chanting that repeats England's joy and sorrow, England's story through almost a thousand years. Here her Kings were crowned and here they were buried; here the people came to do homage and reverence. The day after its consecration Edward the Confessor died and was buried in his church. The Normans, grateful to him who bequeathed to them a throne, made it a place of pilgrimage, living, and followed him here, dead. That fixed the rule. The old Coronation Chair, made for Edward I, contains the Stone of Scone, emblem of Scotch power, which this Edward broke, claiming to be the true "pillow of Jacob." Some thirty kings have sat there to receive a royal diadem.

A PROCESSION OF KINGS

Norman, Plantagenet, Lancaster, York and Tudor, Stuart, Hanoverian, each in his turn; some gladly, some reluctantly, fearing an uneasy crown. A few swift years and then they come again to leave no more, to mingle, through slow centuries, their dust with those who, before and after them, sit here in state. And with them many others, maid and wife, child and parent, poet, historian, soldier, statesman, known and unknown to fame.

It will not do to leave London without

WESTMINSTER ABBEY (NORTH PORCH AND WINDOW): LONDON

London is famed for its churches, of which Westminster Abbey and St. Paul's are the most famous. Fifteen hundred of them, representing almost every denomination and sect, tell of London's religious aspirations.

WESTMINSTER ABBEY (THE NAVE, CHOIR, AND EAST WINDOW)

"One hears in the stillness the hushed tread of processions, breathes the acrid odor of incense, senses the far-away chanting that repeats England's joy and sorrow—England's story through a thousand years" (see text, page 286).

POETS' CORNER: WESTMINSTER ABBEY, LONDON

This is situated in the south transept and contains memorials of England's greatest writers and poets from Chaucer onward. The bust on the left is of Longfellow. James Russell Lowell's contributions to literature are memorialized by a stained-glass window in the Chapter House.

seeing its parks. When my brother, a little lad of seven or eight years, came home from his first London visit, small sister asked: "What did you like best?" In a tone of unalterable, unassailable conviction came the answer: "The Zoo!" Like an Irish friend, he cared more for living than dead lions. After a very satisfying visit to Westminster Abbey, I foolishly asked this friend what he thought of it. "Sure," said he; "it reminds me of a graveyard taken in out of the rain."

WHERE FREE SPEECH IS NO EMPTY FIGURE

Hyde Park, as I remember it, was a place of demagogues and loud-voiced oratory; yet that is manifestly unfair. The brightest and best of England's youth and age ride in Rotten Row (Route du Roi) of a summer morning; drive beside the Serpentine of an afternoon; but almost every Sunday in the year and some days in between hoarse promoters of new labor laws or new religions hold forth just inside the gate to floating audiences, which shift and drift impartially from one speaker to another. To know the park one should see it at both times, and, unless too middle-aged, should join at least once the group of very young and quite old, who sail toy boats on its pretty waters. But to play one ought to go on into Kensington Gardens, and who dares now write of that after Peter Pan? I have looked for him often there—I know the places—but it is too late. I am too old or not old enough.

St. James Park is lovely. It is not large (93 acres), yet the gracious arrangement of trees and shrubs, the winding water, give it an impression of spaciousness. It skirts the broad avenue leading to Buckingham Palace and is flanked by stately buildings. It is loveliest just before sunset, when the trees are casting their longest shadows upon the golden sward and the pelican and heron upon Duck Island are pruning and prinking for the night, their glistening white breasts blushing softly in the sun's last light. There are soft bird-calls and rustlings and twitterings; there is the odor of many flowers; the city's noise is hushed to a distant hum; far away the Westminster bells boom softly; the light fades, flickers, and is gone—so comes the night.

CHAPEL OF HENRY VII: WESTMINSTER ABBEY, LONDON

This exceedingly beautiful chapel was erected by Henry VII, who, with his wife, Elizabeth of York, lies buried here. The whole of the elaborate and intricate carvings call for special admiration, and above the quaintly carved stalls of the Knights of the Garter are their helmets, swords, and banners.

ANOTHER VIEW OF THE CHAPEL OF HENRY VII: WESTMINSTER ABBEY, LONDON

The history of the present great church begins with Edward the Confessor. It is a florid perpendicular and there is nothing lovelier anywhere

HOUSES OF PARLIAMENT AND WESTMINSTER ABBEY: LONDON

"The Houses of Parliament are new—very new—for England and do not oppress us with our own youthfulness. There is no question that they are beautiful. They spring from the river bank like delicate grasses, with here and there a stately, overtopping flower" (see page 285).

PARLIAMENT SQUARE FROM NEW PUBLIC OFFICES: LONDON

The new Palace of Westminster, together with Westminster Hall, forms a single pile of buildings erected since 1840 and covering eight acres. It contains eleven courts, one hundred staircases, and eleven hundred apartments. It has cost in all about $15,000,000. The exterior stone is gradually crumbling, and the basement rooms are said to be lower than the Thames River at high tide.

BIG BEN AND HOUSES OF PARLIAMENT: LONDON

The tower is 300 feet high and the clock 22½ feet in diameter. The great bell, Big Ben, upon which the hours are struck, weighs 13½ tons. A light is shown at night to denote when the "House" is sitting (see text, page 286).

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GREECE OF TODAY

By George Higgins Moses

Formerly United States Minister to Greece

GREECE of today deems herself—and is in truth—the heir to the ages. Not only from her classic past, but from every era of foreign domination, her incomparable spirit has taken and assimilated some feature now distinguishable in her every-day life. Roman, Venetian, and Moslem have thus paid tribute to the brave people whom they have overridden, but whom they could not subdue.

There are few parallels—indeed, at the moment, I can recall but one—to the striking racial phenomenon of Hellenic continuity throughout the vicissitudes of 2,000 years. Modern research has penetrated the dark byways of medieval Greek history, and we now know that the Greeks, whatever their temporary fate, have preserved unbroken the thread of their national existence.

The firmest bond which unites the Greek of today with his illustrious forebears of the golden age is the Greek language, the essential elements of which remain as they were in the days when the tongue served as the medium of the noblest poetry and the sublimest philosophy which the race has yet produced. This tongue traces its unbroken lineage back through medieval and New Testament Greek to the classic speech of Plato and of his contemporaries.

A WAR OF WORDS

And yet, with all this continuity of language, there exists now in Greece a linguistic condition of affairs around which centers a controversy at once comic or tragic; for there are in Greece two languages, or, rather, the one language in two forms — one written by the newspapers, spoken by the educated classes, and used in parliamentary debates and in public documents, including the Scriptures, the circulation of which is regulated by law; and the other a vernacular used by the masses of the people, containing many words of foreign origin, especially Turkish and Italian, arising from those periods of foreign occupation, with a much simplified grammar and rarely reduced to writing, except for private communications. The former is the cultured tongue; the latter the popular idiom; and between the two there rages a merciless warfare, in which fanatical students of the university have lost their lives, ministers their portfolios, a Metropolitan of Athens his miter, and the sweet-faced queen-mother much of her former popularity.

The controversy is too intricate to be briefly summarized, and, like most questions which divide the Levantine mind, it is probably not to be settled wholly in favor of either extreme party. But it has its humorous aspects, as when, during some language riots a few years ago, an impassioned orator for the pure tongue received the congratulations of his audience in the vulgar speech, and an enthusiast for the cultured phrase, who stood near me in a huge mass-meeting in Uni-

Photo by Orlando Root

THE CITY OF ATHENS, GREECE

"Crowning the city, from Pericles to Venizelos, stands the sheer and mighty rock of the Acropolis, dominated by the Parthenon, matchless even in its ruins, which projects the changeless purity of its lines against the background of the changing centuries, which have made of it in turn the shrine of the vestal, the church of the Christian, the mosque of the Moslem, and now and ever the ideal of all the lovers of the beautiful' (see text, page 304).

Photo and copyright by Keystone View Co.

THE ROYAL PALACE: ATHENS

"When the city of Athens passed from Turkish control and was designated as the capital of the new free kingdom of Greece, it was a mere handful of wretched huts clustered about the Acropolis. Today it is a thoroughly modern city, with splendid streets, magnificent public buildings, handsome residences, attractive parks, and most of the modern improvements of which western cities boast. . . . Indeed, had the Greek of today nothing to his credit save the building of the attractive capital of his nation, that alone, it seems to me, would be sufficient to rank him among the constructive agencies of the modern world" (see page 299).

versity Place, kept reiterating his hatred of the common tongue, all the while using the despised medium in which to dress his thought.

THEORY AND PRACTICE

The use of these two tongues is a source of much confusion to the visitor in Greece, especially if he has reckoned upon his knowledge of classic Greek to assist him in his travels. He will be able indeed to read the newspapers without much difficulty, but he will be utterly lost in conversation, not only because of the pronunciation, which is vastly different from the Erasmian method in which we westerners are schooled, but because the spoken tongue, being *demotiké,* will have a vastly different vocabulary from that which he has taken from the dictionary.

For instance, the cultured term for bread is *artos,* and every bakery in Athens—bakeries and barber shops run a close race for first place in the cities—will carry the sign *"Artopoleion";* but if one should enter and ask for *artos* he would probably receive a stony stare, while should he demand *psumé* his wants would be filled.

Again, the classic and the modern cul-

Photo by George Higgins Moses

MAIN BUILDING OF THE UNIVERSITY OF ATHENS

The walls of the colonnades are embellished with scenes from mythological and other eras of Greek history. Note the marble statue of the Archbishop Germanos, the liberator of Greece, near the corner of the building; at the right a wing of the Academy of Science, a splendid reproduction of classic architecture.

tured word for water is *hudor,* and I remember one hot summer's day, soon after my arrival in Athens, that my small boy and I stopped at one of the numerous outdoor cafés to refresh ourselves with an ice, and wishing a glass of water with it, I summoned my courage and called for *hudor,* only to be greeted with blank amazement from the waiter. Finally, summoning that most useful of all means of communication, the sign language, I pointed to a bottle of water at a near-by table. "Ah!" exclaimed the waiter, *"Neró, neró."* But when he had brought me the bottle and I read its label, there was the good word *hudor.*

The passion for the pure tongue to which I have alluded is doubtless to be set down as one manifestation of the intense, even exaggerated, patriotism which possesses the Greek people and which finds its most extreme development in the "Great Idea," which has influenced both the internal and the external politics of the nation for nearly half a century. Briefly stated, the "Great Idea" looks to nothing less than a re-creation of the Byzantine Empire, a dream of dazzling allurement and one for which Hellenism has made tremendous sacrifices.

THE "GREAT IDEA" OF GREECE

Out of the "Great Idea" arises that term of classification which refers to those of Greek blood who exist under Turkish, Serb, or Bulgarian jurisdiction as the "enslaved brethren," in contradistinction to those who are "free Greeks" of the kingdom of the Hellenes; and the effort, blood, and treasure expended by the "free Greeks" in behalf of their subjugated kindred in Crete and Macedonia, even prior to the late Balkan wars, are incredible in amount.

In pursuit of the "Great Idea" Greek bands for years ravaged those portions of Macedonia and Epirus which are not preponderantly Hellenic in blood and aggravated the age-long hatred between Greek and Bulgar, which with difficulty was laid aside but once, and then only long enough to dispossess the Ottoman oppressor, when it broke forth once more with redoubled fury. Because of the "Great Idea" Crete was periodically upset in revolution and for a century this, the largest and the most fertile of the Egean Isles, was rendered useless to either Turk or Greek. Spurred on by the "Great Idea," Constantine's flying columns crossed the Thessalian frontier, forced Meluna Pass, wiping out its tragic memories from the war of 1897, and came in triumph to Saloniki. It was the "Great Idea" which drove the southern Epirotes to their revolt against incorporation in the autonomous Albania which the ambassadors had so summarily set up at London.

Greece of today looks back only three generations, if one places its origin in the War for Independence, which was concluded by the Protocol of London in 1830; and, witnessing the progress which in that brief span has been made in a land of such sparse resources, I cannot see how praise can be withheld from a people who have accomplished so much.

THE NEW ATHENS

When the city of Athens passed from Turkish control and was designated as the capital of the new free kingdom of Greece, it was a mere handful of wretched huts clustered about the Acropolis. Today it is a thoroughly modern city, with splendid streets, magnificent public buildings, handsome residences, attractive parks, and most of the modern improvements of which western cities boast. The building of this city alone in a land of such scanty resources is fairly comparable to the development of our own rich West, and even more meritorious when all the circumstances are considered. Indeed, had the Greek of today nothing to his credit save the building of the attractive capital of his nation, that alone, it seems to me, would be sufficient to rank him among the constructive agencies of the modern world.

In this city of old memories and new hopes, Greek life centers now as in its classic days, and here ancient and modern Greece are inextricably mingled in a curious medley of modernity and antiquity, which colors the most ordinary of every-day affairs. On every hand arise the shattered monuments of its splendid past, and even the tiniest fragments

COLUMNS OF THE HUGE TEMPLE OF JUPITER, WITH THE ACROPOLIS IN THE BACKGROUND: ATHENS

There were 104 columns in the Temple of Jupiter. The temple was surrounded by a terrace, and the substructure on which the columns rest is still almost wholly intact. It was the largest but two of all the temples of the world, only those of Ephesus and Selinus excelling it. Measuring on the upper platform, it was 134½ feet broad and 353½ feet long.

ANOTHER VIEW OF THE STANDING COLUMNS OF THE TEMPLE OF JUPITER: ATHENS

The Temple of Jupiter was begun in the sixth century B. C. and reundertaken by Antiochus Epiphanes four hundred years later. Still later, being unfinished, Sulla took some of the columns to Rome to the Capitoline Temple. In the reign of Augustus a society of princes made an effort to finish it, and at last Hadrian did so. A hermit, during the Middle Ages, lived on top of the columns, letting down a basket for pious passers-by to fill with provisions every day.

Photo by George Higgins Moses

THE EAST FRONT OF THE PARTHENON

The Parthenon is the diamond among all the world's gems of architecture. This exquisitely beautiful and harmonious creation was the design of the architects Ictinus and Callicrates, and was dedicated to Athena in 438 B. C. The great beauty of the lines of the building lies in the subtileness of its curves, there being, in point of fact, no straight lines in the entire structure. The steps rise in a gentle billow from end to end; the columns bulge infinitesimally in the middle; everywhere the eye rests on the exquisite beauty of a delicate curve.

THE FRIEZE OF THE PARTHENON

This frieze is the masterpiece of Attic bas-relief. Measuring 524 feet in length and 3 feet 3½ inches in width, Phidias made masterly use of his opportunity thereon to portray the festal procession that ascended the Acropolis to present to the goddess the robe woven in her honor by the Athenian virgins.

which serve to link the life of the present with the days that are gone are most carefully preserved. For example, in a house which I know well in Athens, set into its interior basement walls are some battered fragments of a slab which were brought to life in making the excavations for the building and which show that on that spot had dwelt a forgotten Athenian of an older day who had been hard pressed and who had mortgaged his house, in token of which the instrument, as was the custom, had been engraved upon the marble walls of the building.

ANOTHER SECTION OF THE FRIEZE OF THE PARTHENON

The frieze was cut round the top of the solid structure inside the columns and was meant to look like a procession passing along on high. It still has this appearance to a person walking some distance away, being carved in deeper relief at the top than at the bottom. The horses' feet, for instance, project about an inch and a half, while their heads extend about two inches.

GUARDING GRECIAN ANTIQUITIES

The Greek government is keenly alive to its responsibility for the safeguarding of its antiquities, and the Department of Archæology, under the charge of the Ministry of Education and Religion, is painstakingly organized and prudently administered. Its income—derived for the most part from the revenues of the lottery, which it shares with the fleet—is never diverted, no matter how dire the necessities of the treasury; and the zealous scholars who now direct its energies have many a good work of excavation and restoration to their credit. The museums at Athens are handsomely housed, conveniently arranged, accurately catalogued, and open to inspection and study without fee, this latter being a point of great pride with Athenians.

In addition there are now, at various points in the kingdom where research is going on, smaller museums devoted to the preservation of the treasures of the locality, which are no longer taken to Athens to enrich the collections there, and if found there at all are in replica only and then solely of the most notable: as in the case of the bronze charioteer of Delphi, whose counterfeit representation in plaster at Athens has sent many a traveler across the waters of the Corinthian Gulf in search of the wonderful original.

Crowning the city, from Pericles to Venizelos, stands the sheer and mighty rock of the Acropolis, dominated by the Parthenon, matchless even in its ruins, which projects the changeless purity of its lines against the background of the

A SECTION OF THE FRIEZE OF THE PARTHENON

"The Greek government is keenly alive to its responsibility for the safeguarding of its antiquities, and the Department of Archæology is painstakingly organized and prudently administered. Its income—derived for the most part from the revenues of the lottery, which it shares with the fleet—is never diverted, no matter how dire the necessities of the Treasury, and the zealous scholars who now direct its energies have many a good work of excavation and restoration to their credit" (see text, page 304).

changing centuries, which have made of it in turn the shrine of the vestal, the church of the Christian, the mosque of the Moslem, and now and ever the ideal of all lovers of the beautiful.

SCULPTURES FROM THE GOLDEN AGE

Near at hand stands the fairest of those other structures which the age of Pericles has given to the ages yet to come; on the one side the tiny gem of the Temple of the Wingless Victory, so chaste and delicate in its proportions and outline, and on the other the Erechtheum, with its unique Porch of the Caryatides, and the whole now restored to its former height largely as a result of the painstaking labor of the American School for Classical Study.

Almost within a stone's throw cluster the chief remnants of the glory that was Greece. Hard by the stairs of the imposing Propylæa — the height of which has always made me think that the Pan-Athenaic maidens were incredibly long of limb—rises the sturdy rock of the Hill of Mars, whence St. Paul declared the Unknown God and incidentally took the Athenian measure for all intervening time. At a little distance stands the rough-hewn Bema, where Demosthenes and Ctesiphon strove in matchless phrase, while just below rise the ivory-tinted columns of the Temple of Theseus, best preserved of all the classic remains.

THE THESEUM, THE BEST PRESERVED OF ALL THE GREEK TEMPLES: ATHENS

Although the marble floor of this wonderful structure has been burnt to make lime, the Theseum still stands as the best preserved example of Grecian architecture. The thirty-four columns supporting the roof are of the stern Doric order. When it was turned into a church the eastern wall of the cella was destroyed and an apse thrown out. At other times it has suffered from earthquakes, which have destroyed some of the fine curves which characterized its construction.

Within a few steps rise the green-clad walls of the Stoa of Hadrian, which tell of that distant day when the Roman Emperor ruled in Hellas. On the further side of the Rock are still other remnants of Roman rule and rulers in the graceful arch of Hadrian—with its jealous inscriptions demarking the city of Theseus from that of the Romans—and the giant Corinthian columns of the huge Temple of Olympian Zeus, which tower into the clear blue of the Attic sky, while nearer at hand, in the very shadow of the Parthenon and within the droppings of the Sanctuary of Æsculapius, is the theater of Dionysus, Greek of the Greek, and serving now in its proportions as the model playhouse of the world.

HADRIAN'S AQUEDUCT

Another relic of Hadrian's day, and still serving the purpose of its imperial builder, dead these 1,900 years, is the ancient aqueduct, dating from the year 146, which still brings the city's ordinary water supply, though among the ambitious plans of betterment now in hand is the construction of a pipe-line from the Lake of Stymphale, in the Corinthian hills, which shall also serve to irrigate the plain of Attica, which has never lost the "light soil" with which Thucydides so long ago credited it.

Against such a background it is easy to project the ties of sentiment which bind the life of the Greek of today to that of the classic worthies from whom he claims direct descent, and it was with only a slight shock that I learned that the man who brought me my morning coffee at the legation bore the tremendous name of Themistocles. And yet it is difficult to visualize the modern Athenian with those who once walked his streets.

Thinking of Homer, of Praxiteles, and of Phidias, one looks for Helen, for Hermes, and for Athene; but the only Helen I ever saw in Athens was an American girl, married to a member of the Cabinet, and whose golden hair, blue eyes, and classic features made her at once the reigning hostess in the city. And it is only in the islands or deep in the country, where the Albanian flood which swept across the Attic plain has never reached, that one finds the facial lineaments and the bodily grace which the ancient sculptor has taught the modern world as being common to all Greeks of classic time. And this survival persists chiefly among the children, because incessant toil and scanty nourishment soon deprive both boys and girls of their native grace and stamp them with the ineradicable marks of a life of labor.

A LAND OF AGRICULTURE

Greece is essentially a land of agriculture, preëminently intended to be such; but, owing to the tremendous drain by emigration from the rural districts, the progress of agriculture has been painfully deficient. In many places the land is tilled only by women and girls; and Megara, a charming village on the bay of Eleusis, which boasts itself as a pure Hellenic community rising above the Albanian flood, where the Easter dancing was once rated as a famous marriage mart, has lost that distinction because, as the maidens sigh, so many of the men have gone off to America. Time was when these men, having accumulated the 10,000 drachmæ ($2,000) with which they might pass as rich at home, came back to open a little shop and end their days in the semi-indolence of fitful merchandising.

But at length so many had followed this course that some of the villages in southern Greece had come to be like that island in the fable of our childhood, where the inhabitants lived by taking in each other's washing; and so scanty indeed had become these opportunities that I remember one occasion when the *Themistocles* came in with 800 Greeks on board who, having "made their pile" in the States, had come back to sunny Hellas. But after visiting their native villages and seeing how meager were the rewards to be gained, 400 of them promptly took passage back to New York by the same ship.

THE LATE KING A FARMER

The late king took a lively interest in practical agriculture, and his farm properties at Tatoi, an attractive château in the hills to the north of Athens, were

profitably administered. To his patronage the Royal Agricultural Society owes much of its success, and under the care of this institution there are now several agricultural experiment stations in various parts of the kingdom, devoting themselves to the improvement of the flocks, the selection of seed, the demonstration of the value of modern implements, and, most promising of all, to a series of experiments in dry farming, to which I had the honor of first calling His Majesty's attention and which, it seems to me, affords the solution of the chief difficulty with which Greek agriculture now contends—the lack of adequate and well distributed rainfall.

The Attic year is sharply divided climatically into two seasons, the rainy and the dry, the latter beginning late in May and extending to early October, and during which there is no rainfall except a single thunder shower, which comes with great regularity during the second week in August. Outside of Attica climatic conditions are somewhat better. In the islands, along the Gulf of Corinth, and in the Morea there is constant greenery—grass, vines, and many trees. But for one who spent, as I did, four summers on end in Athens, it is not easy to learn that hills may have a beauty aside from forests, and that color, contour, and form can lend enchantment to the naked rock. It was long before my New England eye appreciated the wonderful tints which the Athenian sunset throws upon Lycabettus and Hymettus, and that I learned that Athens now, as ever, should be hailed as the "violet-crowned city."

Personally I found the Athenian climate agreeable, and I cannot now recall a single day during all of my stay there when, even in the rainy season, the sun did not shine at least a part of the time. Cold winds there were, to be sure, in winter, blowing down from the snow-capped hills above the town or blowing up from the sea at Phaleron; but there were no frosts; the roses bloomed during every month of the year in the legation gardens; oranges ripened in the open air, and we picked our breakfast fruit from the trees outside of the window, while the palm flourishes there as I have seen it nowhere else, not even in the Riviera. The summer heat is easily endurable, the absence of rain removing the humidity which makes American midsummer so intolerable. Scarcely has the effect of the spring rains worn away than the Ætesian wind begins to blow, commencing with almost clock-like regularity at four in the afternoon and continuing thus for 40 days, while at night cool breezes sweep up to the city from the sea and through the ravines that lead to Alyssida. One cannot truthfully say that midsummer nights in Athens are really cool, but there is a sensible difference from the heat of the day and a freshness which always makes sleep possible.

GREECE'S SOCIAL SEASON

Socially, too, the Athenian year divides itself with the climate. At the end of the rainy season the court, the diplomatic body, and the rich flee away, the latter going, as they say, "to Europe"; and to take their places there flock to Athens and to the seaside hotels at Phaleron and to villas and resorts at Kephisia-in-the-hills numbers of rich Greeks from Asia Minor and from Egypt; and the whole city reverses the order of its winter life, turning night into day and spending most of the hours between sunset and sunrise out of doors.

I do not think the midsummer heat of Athens intolerable, despite a well-nigh constant temperature of nearly 100; but the glare of a cloudless sun, reflected from the marble pavements and the white stuccoed buildings, always gave me, as I went at midday from the legation to the club for luncheon, a sense of being struck in the face by an angry blast of heat. Needless to say, none venture out of doors in the daytime except on compulsion.

Athenian houses are built to resist heat. The exterior and interior walls are all of thick stone, and, with tightly closed windows, one stays in doors until the afternoon tea, when the level rays of the setting sun permit adventure. Then one strolls or drives, dines wherever the dinner hour may find him, and invariably out of doors, journeys by tram to Phaleron for the bathing and the music, seeks

THE BEAUTIFUL CHORAGIC MONUMENT OF LYSICRATES: ATHENS

In ancient Greece the superintendent of a theatrical presentation or director of a chorus was known as a choragus. He was chosen by election, and the office, though very onerous, was held to be one of great honor. He had to provide at his own expense for the equipment and instruction of choruses for tragedies and comedies. The monument of Lysicrates is the only survivor of a number of such structures which stood in the "Street of Tripods" to the east of the theater of Dionysus.

A ROUGH-HEWN FORUM WHERE GRECIAN ORATORS STROVE IN MATCHLESS PHRASE

The latter part of the life of Demosthenes is intertwined with that of his rival Æschines. For his services to the state the Athenians proposed to award him a golden crown, which was opposed by Æschines. Like every other matter, it had to be determined by debate, and all Athens and strangers from far and near gathered to hear the rival orators. In his address, known as the "Oration of the Crown," which has been declared to be the most polished and powerful effort of human oratory, Æschines was completely crushed and sent into exile. Afterward, repeating Demosthenes' oration to some of his disciples and being wildly applauded, Æschines exclaimed, "You should have heard the wild beast himself!"

PRISON OF SOCRATES: ATHENS, GREECE

Socrates believed in the immortality of the soul and in a supreme ruler of the universe, but sometimes he spoke slightingly of the temples and popular deities. This led to his prosecution on the double charge of blasphemy and of corrupting the Athenian youth. The conduct of Alcibiades, who had been his pupil, was held up as a horrible example of the demoralizing tendencies of his teachings. He was therefore condemned to drink the fatal cup of hemlock. The night before his death he spent with his disciples discoursing on the immortality of the soul.

Photo by Henry Ruschin

MILITANT WOMEN OF EPIRUS, GREECE

"Long years of Turkish oppression have, however, left their mark; not in externals . . . but in certain customs and attitudes of mind. Thus the position of women in modern Greek life is semi-oriental, to say the least" (see text, page 320)

Photo by George Higgins Moses

FISHERMEN DRAWING THE NET AT SUNSET ON THE SHORE OF ARAPHINA

"Greek labor, though extremely well organized, is meagerly paid, day laborers receiving no more than three drachmæ a day (a little more than sixty cents), while skilled labor in the trades will average hardly more than twice as much" (see text, page 328).

the cool garden of the Zappeion to see the "movies," or goes to Alyssida for dinner and the vaudeville, and never loses caste by returning home as late as 2 o'clock in the morning.

DINING AL FRESCO

Everywhere about the town, on the roofs of clubs or hotels, in the gardens or on the terraces of restaurants, beneath the pepper trees of the parks, and even in the streets, tables are spread, and I venture to say that more than 100,000 people dine in the open air each night of an Athenian summer.

Greek cookery is more Oriental than indigenous. Lamb or kid, with chicken—which has always seemed to me to be the national bird of all Europe—are the principal meats, though from the shores of Eleusis come delicious wild duck, and other game birds are found near by, while *pilay,* a Turkish dish of rice with chicken or lamb, and *giaourti,* the Bulgarian ferment of milk, are standards in every Hellenic bill of fare. The waters of the Mediterranean yield delicious fish, among them the brilliant and toothsome rouget, the eating of which always made me think I had despoiled an aquariam, and the long-tailed crayfish, which passes for lobster in the warmer climes.

With the renewal of the rains the brown fields and hillsides quickly clothe themselves in green. The Royal Family returns from its "cure," the diplomats

Photo by Henry Ruschin

WOMEN OF EPIRUS, GREECE

"Greek women, generally speaking, have no individuality. At parties they generally sit apart, while in the country they are almost never to be found at table if guests are present, and upon them falls the greater portion of the labor of the household. Following the plow, harvesting, and work upon the roads are common employments for the Greek peasant women" (see text, page 320).

Photo by George Higgins Moses

THE SHIP OF ULYSSES IN THE HARBOR OF CORFU

There is a tradition that a ship invading the harbor of Corfu was turned to stone by Poseidon, the god of the sea, and that the little rock-bound island in the Corfu harbor is the remains of that ship.

come back from leave, the great houses of the city open, the hotels and summer gardens close, the Levantines betake themselves home, and the winter season begins. Entertaining in Athens travels a somewhat narrow circle. State dinners at the palaces, reciprocal entertainments at the legations, few receptions, and still fewer dinners at Greek houses form the backbone of the winter's enjoyment.

STRANGERS RARELY INVITED

Greeks rarely invite a stranger to their board, although among themselves exists a society which the foreign colony knows of chiefly by rumor. Among diplomats, entertaining generally follows fixed forms—a dinner followed by a reception, ball, and the inevitable bridge.

Most Greeks are expert card-players, and bridge tables are generally made up well in advance of the evening of play. The play is rapid and brilliant and such as I rarely dared venture into. I own myself a duffer at cards and my table was generally made up of the same persons, and always among them the charming wife of one of my colleagues, who made an agreeable partner because we both played, as she was wont to say, "by inspiration."

There is much conversation in Athenian salons, and always of a high order. In no capital of Europe, I believe, can be found a more cultured society, and in no drawing-room that I have known does conversation flow so smoothly and at such a high level. Art, politics, and the drama are all well known in Athens, and the Greeks are such accomplished linguists that any foreigner may use his own speech without hesitation. French, of course, is the prevailing foreign tongue, with English pressing it hard for first place.

ENGLISH THE ROYAL FAMILY LANGUAGE

English, indeed, is the family language of the palaces in Athens. The Royal Family in my day was made up of many nationalities. The King was a Dane; his Queen a Russian; the Crown Princess a

Photo by George Higgins Moses

THE CHURCH OF ST. THEODORE, ONE OF THE FINEST OF THE BEAUTIFUL LITTLE BYZANTINE STRUCTURES IN ATHENS

When the Apostle Paul went up to Athens his spirit was stirred "when he saw the city wholly given to idolatry"; so he disputed in the synagogue and the market-place daily until the Epicureans and Stoics heard of him and invited him to give an exposition of his doctrines at the Areopagus. After delivering his address there, Dionysius, the Areopagite, and many others believed. From that day forward Christianity has found an abiding place in Athens.

Photo by George Higgins Moses

ANCIENT BYZANTINE ARCHITECTURE: ATHENS

While the cathedral in Athens is devoid of architectural merit, some of the smaller churches are singularly interesting and beautiful

sister of the Kaiser; the Princess George of the Bonaparte family; the Princess Nicholas a Russian Grand Duchess; the Princess Andrew a Battenburger; and since they all had English nurses and governesses, and since it was necessary to find some common linguistic ground for the royal group, English was the prevailing tongue in the royal households; and it is spoken generally at the ministries, in the hotels, and in the larger shops.

Throughout the country, too—and indeed throughout the entire Balkan region—English is much heard, because of the great numbers of Greeks who have returned home from America; and few travelers in the Peloponnesus will fail to recall at almost every railroad station the eager face thrust in at the carriage window and quivering with the demand, "You fellers from America?"

In this recurring question scholars find a persistence of that spirit of Hellenic curiosity which greeted the traveler in the Odyssey with, "Who of men and whence art thou; where are thy city and thy parents?"

GENUINE CURIOSITY

But modern Greek curiosity goes much further, and the traveler is subjected, even in the larger centers, to a searching examination, which sometimes extends even to a good-natured ransacking of his baggage and which always insures a good-sized gallery for even the smallest transaction. An acquaintance of mine who has done his Grecian experiences into a book, which is a mine of information touching the life of the Greek people today, relates how at Amhissa, which is the capital of a province and therefore possessing the claim to citified indifference, 29 people hung with eager interest upon the bargaining as he haggled for three lemons for 10 *lepta,* a little less than two cents, in this showing how general is the assumption that the Greek of today stands forth in spirit, at least, exactly as his classic ancestors did. I remember, during the revolution of 1909, the late king, in talking to me of conditions as they then existed, said that I would find an accurate picture of things if I would read once more "The Frogs" of Aristophanes.

In fact, the ancient Athenian democracy has projected itself well-nigh intact into the life of Greece as it is today. Class distinctions are unknown. Titles of nobility are forbidden by the constitution, even though every native of Corfu claims to be a Venetian count, and the Crown Prince is known only as the *Diadochos,* or Successor. Neither wealth nor education hinders the association of all upon terms of the most absolute equality.

"FIVE GREEKS, SIX GENERALS"

One unfortunate result of this extreme democracy, so firmly fixed as a Hellenic characteristic, is the disinclination to obey a leader, which has had a strikingly disastrous effect upon both the politics and the commerce of the nation. The Venetians in their day were wont to say, "Five Greeks, six generals;" and it is only of late that anything like coherent coöperation has been possible in Hellenic affairs.

Like many democratic peoples, both ancient and modern, Greeks have an intense distrust one of another; and such of their joint-stock companies as have met with any signal degree of success have a considerable admixture of foreign directors; and jealousy, another characteristic of democracy, is so much a Hellenic trait that even the wisest and most capable of Greek statesmen and warriors cannot long go free of criticism, misrepresentation, or other form of attack.

Because of this condition, copartnerships and joint-stock companies are rare in Greek commerce; but the individual Greek seems amply able to take care of himself in commercial strife. There is a saying prevalent in the East, "Two Jews, one Greek;" and certain it is that Greece shares with Scotland the reputation of being able to hold its own against Israel's competition.

REAL HOSPITALITY

I would not leave the impression that the curiosity with which the Greek searches into the stranger's affairs is due to anything except an extreme friendli-

Photo and copyright by Underwood and Underwood

PIOUS MONKS OF THE EASTERN ORTHODOX CHURCH AT DOOR OF MONASTERY: MEGASPELÆON, GREECE

"Of all the learned professions theology is the most neglected, the priesthood for the most part being scantily educated and in many cases actually illiterate. The cause of this, probably, is that, except in the higher orders—archimandrites, bishops, and archbishops—the rewards of the priesthood are very meager, it being no uncommon thing for a priest to carry on daily labor in competition with his parishioners on week days, while he contents himself with the mere recital of the offices—frequently by rote, for often he cannot read—on Sundays and saints' days" (see text, page 323).

ness. Indeed, the Greek of today, especially in the country, is the most hospitable of moderns. The best room in the house, the choicest tidbits at the table; all the resources of the family, indeed, are freely at the disposal of the passing stranger, without thought or desire of payment; and it is only by means of some subterfuge, such as asking the whole family to drink one's health, that one is able with difficulty to press money upon a host who has denied himself to make his guests comfortable. By some it is thought that this generous trait is a survival of the days of the Turkish oppression, when it was necessary to be

Photo by George Higgins Moses

A SECTION OF THE ERECHTHEUM UNDERGOING RESTORATION BY THE AMERICAN SCHOOL OF CLASSICAL STUDY

The Erechtheum contains the shrine of Athena Polias, which was regarded as the most sacred in Athens. It held the ancient image which was said to have fallen from heaven. Near it stood the sacred olive tree, said to have been produced by Athena, in her contest with Poseidon, who, for his part, produced a salt-water spring by a stroke of his trident.

hospitable to the intruder to avoid spoliation; but I prefer to think that it is due to an inherent friendly disposition which the Greek of today has retained from his earliest days.

Long years of Turkish oppression have, however, left their mark; not in externals—for the jealous royalists who chiseled the N from the Napoleonic monuments were not more industrious in removing all traces of the usurper than the modern Greek has been in destroying all tangible evidences of the Turkish night—but in certain customs and attitudes of mind. Thus the position of women in modern Greek life is semi-oriental, to say the least.

WOMEN WITHOUT INDIVIDUALITY

While the great ladies of Athens have an active social career, Greek women, generally speaking, have no individuality. At parties the women generally sit apart, while in the country they are almost never to be found at table if guests are present, and upon them falls the greater portion of the labor of the household. Following the plow, harvesting, and work

THE GATE TO THE AGORA: ATHENS

The treasures deposited in the Parthenon at Athens belonged to the State and were controlled and disposed of by the vote of the people. Even the personal property of the goddess, the gold drapery of her statue, which was worth about $600,000, could be used in case of great need; but it had to be replaced in due time, with fair interest.

upon the roads are common employments for the Greek peasant woman. Unmarried, her parents and her brothers control her conduct, and a husband means merely a change of masters for whom she toils while he sits at ease. An improvement, however, is gradually developing. The Greek, much more than some of his Balkan neighbors, has outgrown the notion that the sole occupation fit for a man is warfare. Through schools, endowed and under royal patronage; through other en-

Photo by George Higgins Moses

ONE OF THE NUMEROUS LITTLE HARBORS NEAR CORFU

In its wonderful indentation of coastline Greece surpasses the other countries of Europe as Europe is ahead of every other continent. Except a few districts in Thessaly, no part of the country is more than fifty miles from the sea

terprises, and especially through the demands of modern business life, new avenues for employment and advancement are opening for women, and in another generation it is altogether likely that the women of Greece will be found with their sisters of the West, demanding as rights what they now regard as great privileges.

Nevertheless the martial spirit yet remains among Greek men, and the patriotic Greek regards himself as of greatest value to the State when he can present himself with many stalwart sons for service in the army. Among the lower classes—indeed, in most walks of life—the birth of a man-child is regarded as a supreme favor, and large families are the rule in Hellas. Consul General George Horton used to tell me with great amusement of an evening stroll which he took near the Acropolis, when he was startled by a leg of lamb which hurtled through the open window of a cottage, dashed against the wall of the house opposite in the narrow street, and dropped at his feet. It was followed by a volley of angry words, and as he listened he heard the irate husband berate his wife because she had given him no sons which he might give to the army.

A SPLENDID SOLDIERY

Thanks to the labors of the French mission, which, within recent years, has reorganized the army, and to the splendid example of the soldier-king, Constantine, and to the magnificent victories of the campaigns of the Balkan war, the Greek troops find themselves the equal of any body of fighting men in all the world.

Education in Greece is overdeveloped at the top The framework of the public-school system is excellent, but the teachers' profession is held in slight repute and fails to attract either men or women of commanding ability. Moreover, the troublesome language problem, whereby the child receives instruction in a tongue which he does not hear at home, presents an almost insuperable difficulty for effective training of the young. The university at Athens, however, is a splendid institution. In its faculty are many rare scholars and fine administrators. Its enrolment is large, and the work it does is excellent.

Confining its work as it does, however, chiefly to professional and philosophical studies, it has resulted in an overproduction of lawyers, doctors, and engineers, for whom the country can find no sufficient employment, and who have therefore turned their attention to politics and office-holding, with a disastrous reaction upon the public life of the country.

THEOLOGY NEGLECTED

Of all the learned professions, theology is the most neglected, the priesthood for the most part being scantily educated and in many cases actually illiterate. The cause of this, probably, is that, except in the higher orders—archimandrites, bishops, and archbishops—the rewards of the priesthood are very meager, it being no uncommon thing for a priest to carry on daily labor in competition with his parishioners on week days, while he contents himself with the mere recital of the offices — frequently by rote, for often he cannot read — on Sundays and saints' days.

This has always seemed to me a curious situation, because in Greece the church is held in deep and genuine veneration. During the long centuries of the Turkish subjugation, the Church and the Nation were synonymous. It was in the cloisters of the monasteries that the national spirit was kept alive, that the Greek language was preserved, and the Greek traditions nurtured. It was an archbishop of the church, Germanos, who, from his cell in the monastery at Kalavrita, organized the revolt which developed into the War for Independence. A striking statue of Germanos ornaments the ground of the university in Athens, and at its feet on Independence Day, the anniversary of that fateful morning when he issued forth from his cloisters bearing the sacred war banner of Hellenism, are laid the laureled tributes of the people whom he helped to freedom.

The Greeks, externally at least, are a deeply religious people, and the feasts and fasts are rigidly observed. When a Greek fasts, he fasts in earnest, almost his sole nourishment being a coarse soup

THE LION GATE AT MYCENÆ

Mycenæ was one of the most ancient cities of Greece, at one time being the center of a powerful State. In the fifth century it was destroyed by the Argives, and at the time of Pausanias it was deserted and has remained so ever since. The Lion Gate stands at the northwest corner of the Acropolis and is approached by a walled-in way, the object of which was to force any one approaching to expose his unshielded side to attack from the fort.

PANORAMIC VIEW OF DELPHI

The oracle of Apollo at Delphi shared with that of Zeus at Dodona first rank among those of the ancient world. A splendid temple was erected over a deep fissure in the ground, which emitted stupefying vapors thought to be the inspiring breath of Apollo. A priestess seated upon a tripod, overpowered by the exhalations, delivered the messages of the god. No colony was founded without the superintendence of the Delphian god. Crœsus was informed that if he undertook an expedition against Persia he would destroy an empire. The end justified the prophecy—his own went down.

Photo by George Higgins Moses

THERE ARE SAID TO BE MORE GOATS THAN GREEKS IN GREECE

"Greece is essentially a land of agriculture, preëminently intended to be such; but, owing to the tremendous drain by emigration from the rural districts, the progress of agriculture has been painfully deficient. In many places the land is tilled only by women and girls" (see text, page 307).

of black beans, palatable and nutritious, but likely to prove most monotonous after 40 days.

FEAST DAYS AND EASTER

Feast days are literally celebrated, the crowning festival of the year being, of course, that of the resurrection, following the rigorous abstinence of the 48 days of Lent. Greek orthodoxy then shows its wonderful symbolism at its best. The ceremonies begin in the early morning of Good Friday with a recitation of the so-called "Twelve Gospels," and on this occasion the embroidered cloth bearing a representation of our Lord in the tomb is placed upon a bier in the center of the church, where it receives the adoration of the faithful.

In the evening the burial service takes place, when processions issue from all the churches with torches, military bands playing a funeral march with muffled drums, and following the Epitaphios through the streets. In the line are the Metropolitan archbishop, the Holy Synod, and the priests, all in their most gorgeous robes and carrying the sacred emblems. Marching solemnly, are the Ministers of State and great dignitaries of the army and the navy; all about, the streets are lined with people bearing lighted tapers, and the solemn climax comes when the processions from the various churches file together into the great Square of the Constitution before the palace.

Shortly before midnight on Easter eve another great ceremony takes place before the cathedral, where, upon a platform, assemble the Royal Family, the ministers, and the dignitaries of the realm, each holding a lighted candle. The cathedral bell tolls the solemn hour of midnight; there is a moment's hush and the Metropolitan cries in deep tones, "Christ is risen." All the people respond, "He is indeed." The bells of the city break forth into pealing, bands of musicians play the national air, a salute of 101 cannon is fired, and the people hasten

Photo by George Higgins Moses

THE HILL OF MARS, WHERE ST. PAUL DECLARED THE UNKNOWN GOD

"Then Paul stood in the midst of Mars' Hill, and said, *Ye* men of Athens. I perceive that in all things ye are too superstitious. For as I passed by, and beheld your devotions, I found an altar with this inscription, TO THE UNKNOWN GOD. Whom therefore ye ignorantly worship, him declare I unto you" (Acts 17: 22, 23).

THE MOST FAMOUS OF MOUNTAINS, MOUNT ARARAT IN ARMENIA

Photo by H. F. Reid

The peaks seen in the picture are Great Ararat (17,000 feet) and Little Ararat (13,000 feet). They are about 7 miles apart and form the boundary of Russia, Persia, and Turkey, to each of which they partly belong. "Armenia is the motherland, the cradle of humanity, and all other lands are her daughters; but she is fairer than any others. Even her mountain tops of perpetual snow are a crown of glory; the sun kisses her brow with the smile of morning, and she supplies the beautiful rivers Euphrates, Tigris, Pison, Araxes, and many others from the jewels of her crown" (see text, page 330).

home to break their long fast, each household having sacrificed a lamb for the paschal roasting. For days before Easter the roads leading into Athens are white with the flocks being driven for the festal sacrifice.

GREEK LABOR WELL ORGANIZED

Greek labor, though extremely well organized, is meagerly paid, day laborers receiving no more than three drachmæ a day (a little less than 60 cents), while skilled labor in the trades will average hardly more than twice as much. Carpenters, masons, and mechanics generally use the most primitive of implements; yet the amount of work which they perform in a day is astonishing. The guilds, or corporations, which correspond to our labor unions, embrace practically all the manual pursuits, and one of the most striking scenes that I recall from my Athens days was the wonderful demonstration of the organized guilds, 50,000 strong, who marched through the streets of the city in the early autumn of 1909 and presented to their King a petition embodying the demands of the revolutionary leaders of that year.

That revolution for a time threatened the throne. Its leaders sent the Crown Prince into virtual exile, where he remained for more than a year; and the King himself during that period was often of two minds regarding abdication.

But with the coming of Venizelos from Crete, to extricate the Military League from the parliamentary pitfalls into which it had tumbled, began the rejuvenation of modern Greece. Constantine was summoned home and replaced at the head of the army; military reorganization was taken up in all branches of the service; the ministries, too, were purged; the constitution was rewritten, and the country set in the path which led to the glories of the Balkan wars. The dreadful assassination at Saloniki cast only a brief shadow across the sun of Hellenic promise, and the recent general elections have shown that the Greek mind is now fairly freed from the shackles of jealousy, prejudice, and insubordination which so long have bound it.

Thus Greece of today looks both to the past and to the future. From the ages that are gone she has derived a splendid tradition. From the days that are to come she doubtless will take new glories.

ARMENIA AND THE ARMENIANS

By Hester Donaldson Jenkins

Author of "Bulgaria and its Women," in the *National Geographic Magazine*, April, 1915

ARMENIA is a word that has widely different connotation for different peoples. To us Americans it means a vague territory somewhere in Asia Minor; to the makers of modern maps it means nothing—there is no such place; to the Turks of a few years ago it was a forbidden name, smacking of treason and likely to bring up that bugaboo "nationalism," than which Abdul Hamid II feared nothing more, unless it were "liberty"; but to nearly two millions of Russian, Persian, and Turkish subjects it is a word filled with emotion, one that sends the hand to the heart and calls up both pride and sorrow.

Armenia is not easy to bound at any period of history, but, roughly, it is the tableland extending from the Caspian Sea nearly to the Mediterranean Sea. Its limits have become utterly fluid; the waves of conquering Persians and Byzantines, Arabs and Romans, Russians and Turks have flowed and ebbed on its shores until all lines are obliterated. Armenia now is not a State, not even a geographic unity, but merely a term for the region where the Armenians live (see map, page 359).

LARGER THAN GERMANY AND FRANCE

At the height of its power and at its greatest extent the ancient Kingdom of Armenia consisted of 500,000 square miles of fertile tableland, extending from the Black Sea and the Caucasus Mountains to Persia and Syria. It rises until it reaches 8,000 feet above the sea, then it ascends abruptly to the snow-capped peak of Mount Ararat, which is 1,000 feet higher than Mount Blanc. The land is fertile, rugged, and beautiful. A native of the country writes of it with pardonable enthusiasm thus:

"Armenia is the motherland, the cradle of humanity, and all other lands are her daughters; but she is fairer than any other. Even her mountain tops of perpetual snow are a crown of glory; the sun kisses her brow with the smile of morning, and she supplies the beautiful rivers Euphrates, Tigris, Pison, Araxes, and many others from the jewels of her crown. These rivers penetrate to every corner of the land, traverse many hundreds of miles to give life to the fields, the vineyards, and the orchards, to turn the mills, and finally close their course in the Caspian Sea, the Black Sea, and the Gulf of Persia, carrying the bounty and good-will messages of the motherland to her children in remote parts—to Persia, India, and Russia. From the same inexhaustible reservoirs she feeds her noblest lakes—Sevan, Urumiah, Van, and the rest."

TWO MELONS A CAMEL'S LOAD

This country of Asia Minor is a fine grazing land and an excellent agricultural region. It is so fertile that two melons are said to be a camel's load, and it produces grapes, wheat, Indian corn, barley, oats, cotton, rice, tobacco, and sugar; all the vegetables that we know in America, quinces, apricots, nectarines, peaches, apples, pears, and plums. The Armenians export silk and cotton, hides and leather, wine, dried fruits, raisins, tobacco, drugs, and dyestuffs.

In minerals, too, the country is rich. Coal, silver, copper, iron, and other minerals lie beneath the surface, but the Turkish government has not allowed them to be exploited.

James Bryce thus speaks of the land: "Here is a country blest with every gift of Nature; a fertile soil, possessing every variety of exposure and situation; a mild and equable climate; mines of iron, copper, silver, and coal in the mountains; a land of exquisite beauty, which was once studded with flourishing cities and filled by an industrious population.

"But now from the Euphrates to the Bosphorus all is silence, poverty, despair. There is hardly a sail on the sea, hardly a village on the shores, hardly a road by which commerce can pass into the interior. You ask the cause and receive from every one the same answer—misgovernment, or rather no government; the existence of a power which does nothing for its subjects, but stands in the way when there is a chance of their doing something for themselves. The mines, for instance, cannot be worked without a concession from Constantinople."

NO BRIEF CIVILIZATION

Into the soil of this beautiful and historic land the Armenians have thrust deep roots. No brief civilization is theirs dating back to *Mayflower* or even Norman Conquest, but one that is almost coterminous with recorded history; and every Armenian feels behind him this vast antiquity, giving him personal dignity and great national pride. They begin their history with the Garden of Eden, which they claim was in Armenia, basing the claim on the naïve statement that the land is beautiful enough to have included Paradise, and also laughingly asserting that the apples of Armenia were worthy to tempt a most Epicurean Eve. Their first recorded ancestors they find in the book of Genesis.

Russian Armenia consists of the provinces of the Caucasus, and further south the sun-baked plains leading to the base of Mount Ararat, where, in the midst of fields, vineyards, and cultivated fields, lies Etchmiadzin.

A taste for the arid red plains of Asia Minor, with their occasional beautiful tree or still rarer blue lake, is, I think, an acquired one, although I confess to sharing the love of the native for this brilliant land, where the soil is so red and the sky

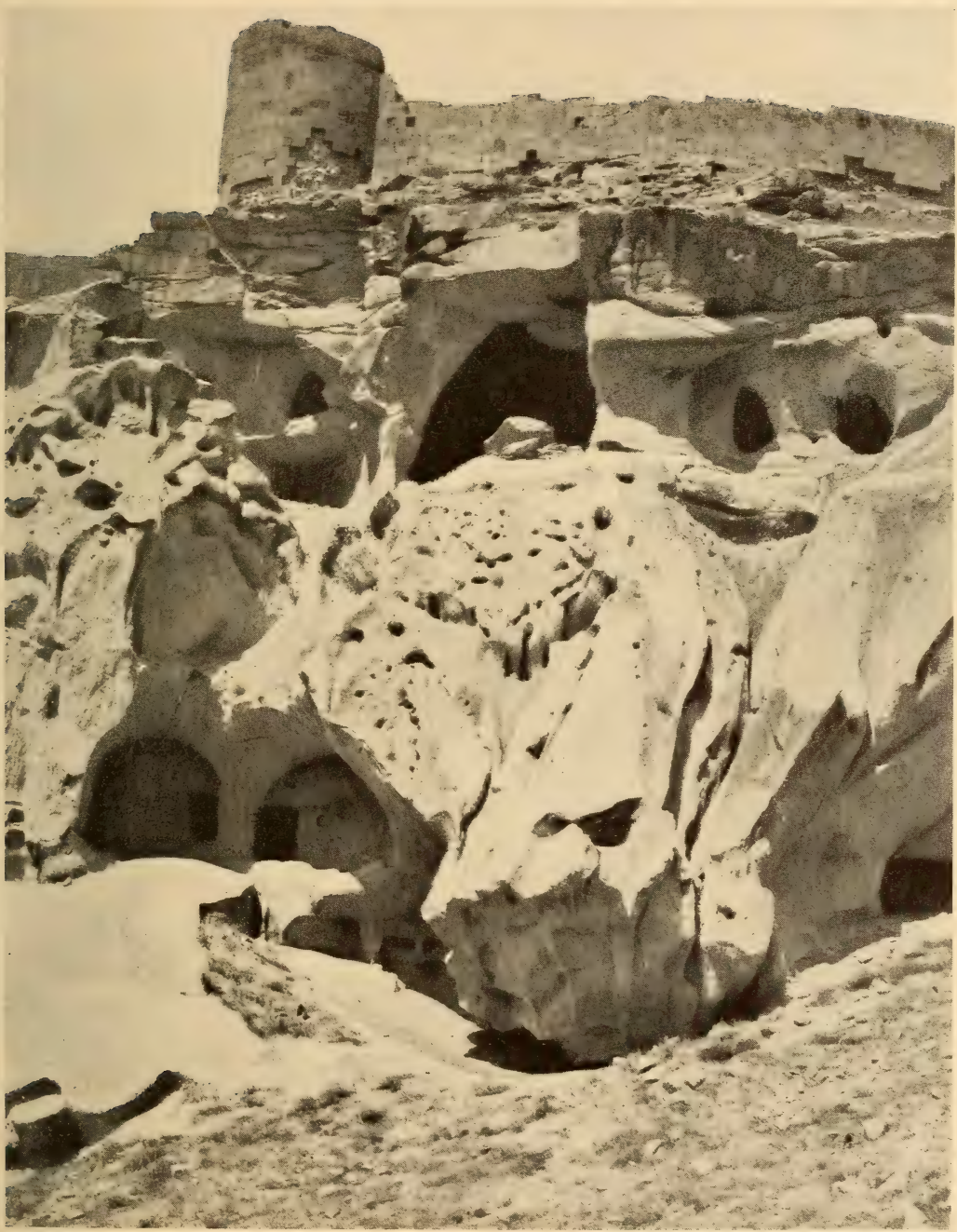


Photo from "Le Tour Du Monde"

THE RUINS OF ANI, THE ANCIENT CAPITAL OF ARMENIA

During the early Middle Ages the Armenians, who have long been under Turkish rule, were independent. Ani was their capital, and it had its fortresses, palaces, and churches. Many of them are still standing, but the city does not contain a single inhabitant. It fell into the hands of the Turks in the fourteenth century and was desolated. For 500 years patriotic Armenians have returned from time to time to this scene of their former greatness, usually dwelling in its grottoes during their stay. These grottoes were hewn out of the solid rock upon which Ani was built.

THE MOST COMMON VEHICLE IN ARMENIA

"Armenia is not easy to bound at any period of history, but, roughly, it is the tableland extending from the Caspian Sea nearly to the Mediterranean Sea. Its limits have become utterly fluid; the waves of conquering Persians and Byzantines, Arabs and Romans, Russians and Turks have flowed and ebbed on its shores until all lines are obliterated. Armenia now is not a State, not even a geographic unity, but merely a term for the region where the Armenians live" (see text, page 329; also map, page 359).

ARMENIANS DANCING

The Armenian national dance is not such a thrilling affair as the fox trot, neither does it have the stately grace of a Virginia reel. It reminds one more of a rhythmic "Ring around the Rosey," like the Bosnian national dance

so blue and each tree is like a distinct personality. I know how homesick for this land the Armenian can be when he comes to our shores; I know how the iridescent lights fall on rolling lands, and how the gay flowers dot the fields in springtime, and how so many towns nestle in the "shadow of a great rock."

But no one could fail to admire the beauty of the Caucasus at first sight. It is hard to conceive a more wonderful journey than that over the Georgian road from the Georgian-Armenian city of Tiflis up into the fastnesses of the mountains, culminating in a face-to-face view of superb glacier-clad Mt. Kasbek, then down through the historic Gorge of Dariel to the plains once more.

THE ARMENIAN CHURCH

The Armenian Church is called after Gregory the "Gregorian," assuming no such pretentious title as "Orthodox" or "Catholic." It differs from the Greek Church very little in creed, but, unlike the Greeks, the Armenians are not theologically inclined, and lay little stress on doctrine. They have always been, however, devotedly trinitarian.

The Armenian Church has been persecuted not only by Moslem and Fire-worshipper, but also by Roman and Greek; yet it is one of the beautiful characteristics of this ancient church that it never persecutes in its turn. It fellowships with all churches, holding that Christianity means brotherhood through Jesus Christ and gives no warrant for oppression or anathema.

The music and ceremonies are naturally very primitive, dating back to the time when the courtyards of the church were the dramatic centers of the parishes and moral and spiritual lessons were taught through simple drama. Such services as those of Holy Week, observed even in our own time, illustrate this; for instance, the washing of the disciples' feet and the literal raising of Jesus by pulleys up a tower. The Greek Church preserves similar primitive histrionic services. Armenians love their church devotedly, and say that although they may get more instruction from a Protestant sermon, their own services seem to them warmer, touching their emotions and helping them.

ARMENIA'S ROME

The center of the Armenian Church is at Etchmiadzin, in the Caucasus Mountains, where stands the fine old cathedral built eight hundred years ago in response to a vision. This church, square and surmounted by an octagonal tower, with courtyard and outbuildings, and its altar in the center, has been a model for Armenian churches ever since; while the little chapel to Saint Gregory, in form a canopy, has become the type of the peculiar porches that are usually attached to Armenian churches. The cathedral contains a miraculous picture of the Virgin, many sacred relics, and the sacerdotal oil, with which every true Armenian must be anointed at his birth, his marriage, and just before his death. This oil is distributed for use to every Armenian church. There are also at Etchmiadzin gorgeous vestments, tanks of celebrated fish, a world-famed library containing 3,000 illuminated manuscripts, and some old portraits. Schools and an ecclesiastical college educate the Armenian youth for the priesthood.

Here under the shadow of Mount Ararat lives the "Catholicos," or pope of the Armenian Church, a stately man in splendid robes and hood, accompanied when he goes out by a bodyguard in scarlet and gold. The present Catholicos is George V, Surenian, the 127th Catholicos in regular succession from Gregory the Illuminator. Such is the oldest Christian Church.

Before we turn to the history of the Armenians let us consider their race and characteristics.

RESEMBLANCE TO THE JEW

Their appearance is definitely eastern; swarthy, heavy-haired, black-eyed, with aquiline features; they look more Oriental than Turk, Slav, or Greek. In general type they come closer to the Jews than to any other people, sharing with them the strongly marked features, prominent nose, and near-set eyes, as well as some gestures we think of as characteristically Jewish. The type is so

Photo by Stephen Van R. Trowbridge

AN ARMENIAN WOMAN, A MOUNTAIN DWELLER, CARRYING A GREAT LOAD OF FIREWOOD DOWN THE ROUGH MOUNTAIN SIDE

The Armenians are the workers of the Near East. Added to a business ability superior to that of the peoples around them, they have, in sharp contrast to their Asiatic neighbors, great capacity for work and well-directed frugality.

pronounced that to those who are akin to them they seem often very handsome, while to westerners they seem a little too foreign-looking. Of course, the type is not always preserved; white skins, even an occasional rosy cheek may be seen, and there is a small number of fair-haired and blue-eyed Armenians.

The resemblance to the Jews does not stop with physical features, for the fate of the two peoples has been sufficiently similar to bring out common traits. Like the Jew, the Armenian has been oppressed and persecuted, and has developed a strength of nationality, a love for his own people, and a persistence of type rarely seen elsewhere. Like the Jew, he has learned to bend, not break, before the oppressor, and to succeed by artifice when opposed by force. How else had he survived? Like the Jew, he has developed strong business instincts, and like him he has a talent for languages, a power of concentration, and unusual artistic gifts. Both Jews and Armenians are very clever actors.

These resemblances have made many scholars question whether the two races are not akin; whether the Armenians may not be descended from the lost Ten Tribes of Israel. But the philological basis for such an hypothesis is lacking,

ARMENIANS PREPARING "BASTOURME," BEEF DRIED IN THE SUN, NEAR VAN

and the Armenians and their language are adjudged to be not Semitic, but Aryan.

My Armenian friends are to be found largely among my Armenian students at Constantinople, some fellow-teachers, and a few faithful servants.

When the present college was founded, a mere primary school called the Home School, its first students were Armenians eager to get an education. For many years the Armenians were the most numerous of the nationalities present. Scutari, where the college was situated until it moved across the Bosphorus last year, is an Armenian quarter, so that long after Greeks and Bulgarians came in larger numbers into the boarding college the day scholars were predominantly Armenian.

ARMENIANS AS STUDENTS

As students the Armenians differ among themselves, ranging all the way from dense stupidity to brilliance, but averaging high in their studies. Of the three students who distinguished themselves in philosophy in a dozen years, one was Turkish, one was Greek, and one Armenian. In English composition, while perhaps the cleverest and most humorous papers were written by Greeks, and the stories with the most action and vim by the Bulgarians, those showing the most grace and fancy were written by Armenians. Oriental girls rarely enjoy mathematics, but the one student who so craved mathematics that the professor in that department had to form special classes to give her all that advanced American colleges offer was an Armenian.

The college chorus and choir always contained many Armenians, and in my day the special soloist on all occasions was an Armenian who sang like a bird, with natural style. She has since studied music in Paris, and is now doing concert work in Constantinople. Like other Orientals, the Armenians have dramatic ability. I well remember one strongly featured Armenian girl who acted the double rôle of priest and king in a Sanscrit play with marked effect. I recall in that same year a pretty Armenian girl who played the part of Toinette in *"Le Malade Imaginaire"* with more charm and piquancy than I have seen in any American production of that classic. The pronounced features and splendid eyes and hair of so many Armenians make them extremely effective in tableaux.

FULL OF SENTIMENT

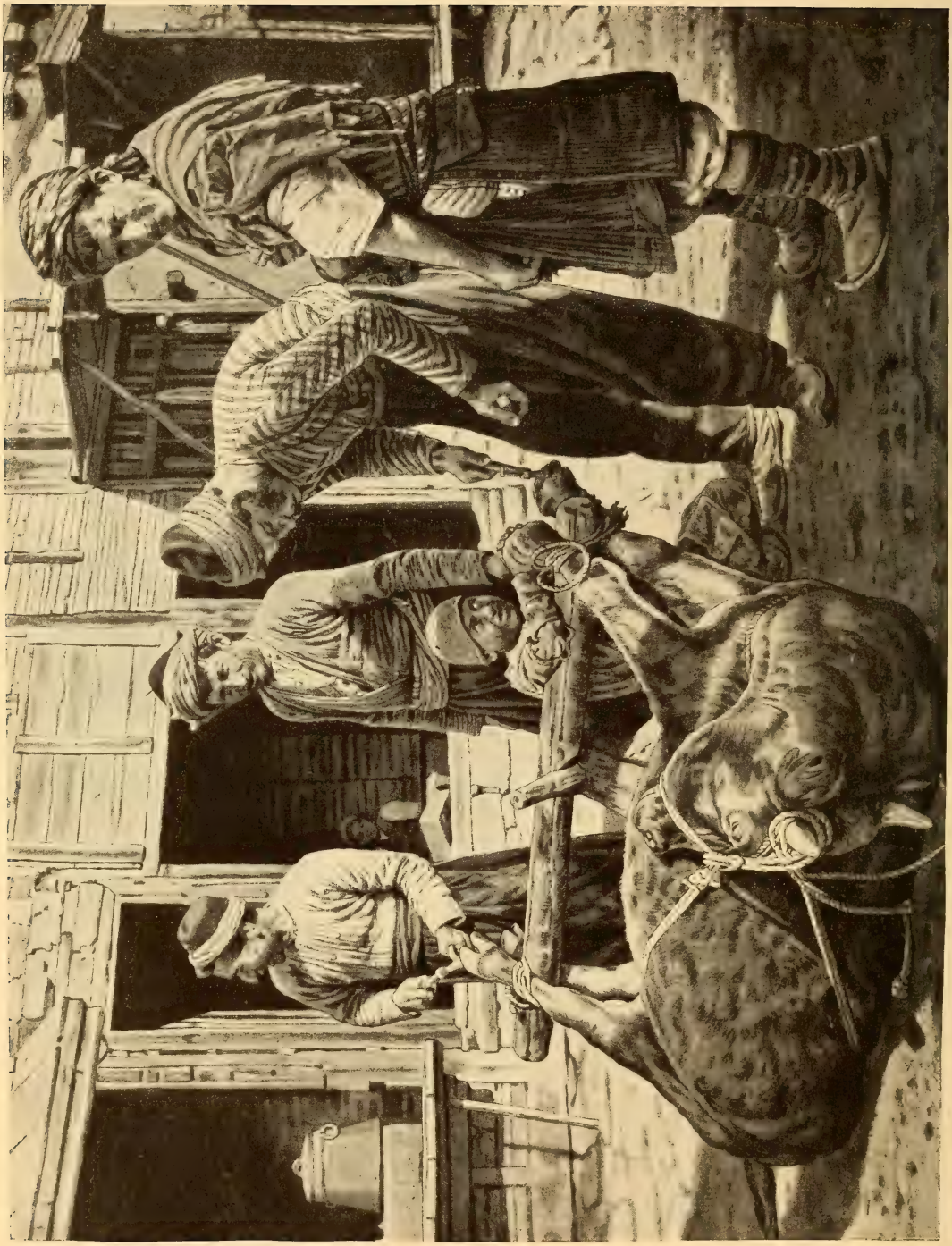
Armenian women are full of sentiment and emotion, and unless they have been repressed by harsh experience they are unrestrained in expression. When the news of the death of a schoolmate reached one of our dormitories, the girls wept and even screamed with such abandon that one of them became actually ill and had to go home. Yet under torture and persecution these women have shown marvelous patience and endurance.

Where there is so vigorous a national pride, some personal conceit would naturally follow. That is not always the case; some of the most modest and humble of women are among my Armenian friends; but a characteristic expression of complacency that one often hears is: "He is a fine man; he likes *me*."

In these young girls does one find any reflection of the tragedy of the race? Yes, one does, although many an Armenian girl of prosperous family is as gay and light-hearted as a French girl. Let me tell of a few of our girls, giving borrowed names.

Filore was a sparkling girl, with jet black hair and shining eyes and teeth. She was delightfully responsive in class, although her quick appreciation was rather shallow. She was always happy and care-free. Her father was high in Turkish favor and she had apparently no consciousness of her people's sufferings.

Zabelle was another happy girl, but of quite a different type. She was small and plump, and maintained a position at the head of her class only by constant hard work. One would never associate her with tragedy in the remotest way. But when, in 1908, people's tongues were loosed, the press freed, and people seemed to wish to express their long pent-up emotions, Zabelle wrote a composition. She began in her clear round



SHOEING AN OX ON THE VILLAGE MAIN STREET: VAN

AN ARMENIAN FAMILY OF VAN

"Their appearance is definitely eastern; swarthy, heavy-haired, black-eyed, with aquiline features, they look more Oriental than Turk, Slav, or Greek. In general type they come closer to the Jews than to any other people, sharing with them the strongly marked features, prominent nose, and near-set eyes, as well as some gestures we think of as characteristically Jewish" (see text, page 334).

hand, "I have always wanted to tell about my cousin Mesrob, but I did not dare; now I can speak," and there followed a horrible tale of persecution, torture, and death inflicted on an innocent young man.

"MY COUNTRY"

Heigoohee was touching in her expression of the joy that it gave her after the revolution of 1908 to be able to say "My country," for she had always felt so lonely when among girls who had countries of their own, such as the English and Turkish girls.

One of the sweetest souls I ever knew was Annitza. She was a Protestant from one of the mission schools in Cilicia. She was older than most of the girls, a woman in character and suffering. She was very delicate and unconsciously appealing, and absurdly grateful for any little thing that was done for her. Her appreciation of beauty was very great.

Once I took her to see the wondrous mosque Sancta Sophia, in Constantinople, with a class of girls. She wandered off by herself, and when I found her she was sitting quietly wiping the tears from her eyes, because it was "so beautiful." Annitza was one of three girls who came from the district of Adana, where the massacres took place in the spring of 1909. For several weeks we gave these girls a separate place to eat and sit while waiting for news of their loved ones. One day I met Annitza in the corridor and uttered a light word. Her face stopped me, and I said quickly, "Bad news, Annitza?" She made a pitiful effort at self-control, then said "Oh, teacher, eleven of them!" and despite the respect that keeps an Oriental girl from familiarities with a teacher, threw her arms around my neck and wept. And that was not the whole tale. The next week added four more to the list of victims in her family. Patient Annitza, with her soft pathetic eyes, always

ARMENIAN GIRLS WEAVING RUGS AT VAN

There is a large American mission at Van, with schools, an orphanage, and a resident doctor. A French Dominican Mission, also, before the present war, maintained a school here

ARMENIANS

seemed to me a type of the Armenian victim.

A DISILLUSIONED SOUL

Hrypsimé was not a type at all; she was a strangely individualized girl, but the product of suffering and revolution. One would not have thought it to see her in school, eager to learn, docile, appreciative of all little gaities, patient in her poverty and humiliation. She was scarcely over 15 years old, a preparatory student, but her compositions revealed an embittered, disillusioned heart. She also began to express herself after 1908 and poured out tales of persecution and revolution with bitter vindictiveness and hate. On the day of the battle, April, 1909, Hrypsimé ran off to join the Red Cross. When I asked whether her mother knew, she shrugged and said: "My father gave his life for revolution; why should I try to save mine?" I do not know what has become of her, but I have often hoped that some one has been able to put into her heart the love and faith in man and God that her cruel childhood seemed to have crushed out.

No account of my Armenian friends would be complete without mention of Hozanna, faithful servant for 30 years at Constantinople College. Dear Hozanna, of the beatific name, the Madonna eyes, and the ample bosom, who gave "my teachers," as she called us, the home feeling, who sent us forth for our vacations with the phrase "Go with smiling," and welcomed us back with soft words of greeting.

To you, Hozanna, living your life of devoted service to the Americans, to you, and through you to the Armenian nation, I send my salaams.

TYPICAL TOWNS

A typical Armenian town of the better class is Bardezag, near the Gulf of Nico-

AN ELOQUENT PICTURE OF POVERTY IN ARMÉNIA

medea. This is a town of narrow streets, paved with great stones and bordered by dark, narrow houses made of the unslaked brick of the Scriptures, but with the straw much in evidence. The edges of the streets serve as gutters, and the doorsteps over them are littered with children. There is one school-house which is a sort of social center, serving as lecture-room or concert hall at need. There is, of course, the square Gregorian Church. There is also a silk mill, and the fields are filled with mulberry trees wherewith to feed the hungry silkworms. On the edge of the town are an English orphanage, founded after the massacre of 1896, and an American college for boys, the latter being the great center for enlightenment for the neighborhood. The fields are fertile and well tilled, but beyond them rise beautiful hills, whence descend the marauding Kurds to reap where they have not sown.

The people are largely agricultural, although there are many of them engaged in the intellectual and business interests of the town. The women wear Oriental costumes—bloomers, dark bodices folded across their breasts, hair braided in two or more braids, often dyed with henna, and when on the street a kerchief over the head. Most Christian women in the interior of Turkey find it safer to veil when abroad. In Constantinople the Armenian women dress like Europeans, but rather more showily. The men of Bardezag dress like the Turks, in loose collarless coats and the red fez, but in Constantinople dress like Europeans. There is considerable intellectual activity in Bardezag, and some noted revolutionaries have gone forth from that town.

AN ARMENIAN VILLAGE

An Armenian village of the primitive sort is Chalgara. When an American missionary brought report of this wretched little village, separated from its neighbors by the impassable roads, where the people were lost in ignorance and dirt, an Armenian lady, graduate of Constantinople College, offered to go and live with them. She took up this hard and disgusting life; she is teaching the people to read and write, to be industrious and honest, to grow vegetables and make clothes, to scrub their houses and say their prayers. Such is the work a consecrated Armenian can do for her people.

The best-known Armenian towns are Erzeroum, a fortified town containing interesting remains of the Seljuk Turk rule; Kharput, a little town 4,350 feet above the sea; Bitlis, not far from Van; Van itself, on the beautiful blue lake of the same name; Diarbekir; Marash, near stately Mount Tarsus; Tarsus and Adana, in the same district of Cilicia, and Marsovan. In all of these towns the population is partly Christian, partly Moslem, with enough armed Kurds to terrify the Armenians. Over the frontier, within Russian Armenia, lie Erivan and Etchmiadzin, with the city of Tiflis, which is largely Armenian.

One of the great Armenian cities, now but a heap of ruins, was Ani, in Cilicia, which was excavated in the last century and shows traces of a high civilization. Here are to be seen remains of conical-roofed churches and massive walls 40 to 50 feet high, flanked by many round towers and protected on two sides by deep gorges. Yellow stone-work, black basalt, decorative sculptures in the churches, rude carvings in the caverns, and faint remains of colored frescoes indicate an art development of no mean order.

BRYCE'S TRIBUTE

James Bryce, in his "Transcaucasia and Ararat," writes of Ani (see p. 331):

"These monuments leave no doubt that the Armenian people may be included in the small number of races who show themselves susceptible of the highest culture. They exhibit the Armenians as able and sympathetic intermediaries between the civilization of the Byzantine Empire, with its legacies from that of Rome, and the nations of the East. They testify to the tragic suddenness with which the development of the race was arrested at a time when their capacities thus formed were commencing to bear fruit."

The city of Ani did not last long. It fell into the hands of the Byzantines and was destroyed not long after. Its fate is

Photo by Fritz Morris

ARMENIAN WOMEN LISTENING TO A SERMON AT THE FUNERAL OF AN ARMENIAN ARCHBISHOP AT TEHERAN, PERSIA

Turkey is not the only country in the world with an Armenian population. Out of 2,900,000 Armenians now living, approximately 1,500,000 live in Turkey, 1,000,000 in Russia, 150,000 in Persia, and 250,000 in Europe, the Americas, and the East Indies

Photo by Stephen Van R. Trowbridge

THE LATE PROFESSOR H. BEZJIAN

A distinguished Armenian citizen of Aintab and Professor of Physics in Central Turkey College

sadly symbolic of the fate of Armenian homes from that time to our own.

AROUND ARARAT

Emerging from tradition, a distinct Armenian people appears about 1000 B. C., dwelling on the table-lands near Ararat. Having no natural boundaries, the State was seldom independent, but was subjugated in turn by Babylonia, the Medes and Persians, the Seleucidæ and the Romans. The ancient Oriental idea of conquest left, however, a good chance of national development. Conquest meant little more than tribute. The Armenians boast of a proud culture during the ancient period and lines of noble kings. The Armenians were closely allied to the Parthians by religion, culture, and propinquity, and were one of the few ancient peoples who were never Hellenized.

It is in the early Middle Ages—ages that we of the West call "dark," but that to the Near East was a period of great culture—that Armenia attains its highest position, and it is through Christianity that it made its contribution to the world.

In the year 310 A. D., 15 years before the establishment of the Greek Church, the Armenian Church was founded by Krikor or Gregory the Illuminator, and Armenia became the bulwark of Christianity in the East. Gregory was baptized by Christian relatives in his childhood. His story is an interesting one, telling of an early marriage, the birth of two sons; then of his "vocation" and entrance into a monastery; of his attaching himself to Tiradates, who soon became king; of Tiradates' persecution of Gregory because he would not accept the old gods; of years in prison; of his release in response to a vision; his miracles; the conversion of Tiradates and the baptism of a thousand Armenians, until in eight years Armenia was fully Christianized and the religion was adopted by the State.

Photo by Stephen Van R. Trowbridge

A CROWD OF TURKS IN THE MARKET-PLACE OF AINTAB

"In the courts of justice the word of an Armenian will not be taken against that of a Moslem. . . . No Armenian's life, his property, nor the honor of his women has been safe in Turkey for a century" (see text, page 354).

The mummied hand of Saint Gregory is still laid on the head of every bishop at his consecration, thus carrying on the most perfect apostolic succession in the world.

TRANSIENT GLORIES

The glories of independent Armenia quickly passed. With the seventh century there arose a power in the East more fatal to Armenia than any of her ancient enemies—the religion of Islam. Like wildfire, the religion of Mohammed spread from Mecca to Gibraltar; but when it reached the Armenian people it found a substance it could not consume; the Armenians could not be converted to Islam, although their kingdom could be burned to ashes and their people enslaved. Like fire and water, Islam and Christianity met and struggled, but neither could destroy the other, until they settled down in the same land, sullenly irreconcilable.

The races might long ago have been blended, for they are not temperamentally antagonistic, but, on the contrary, well fitted to be friends; but the two clashing religions, each claiming the world for its kingdom, could never be reconciled.

First, as the followers of the Prophet conquered Syria and the Armenian provinces of Byzantium, came the Arabs; later came the Seljuk Turks and subjugated part of Armenia, and finally the Ottoman Turk conquered a vast empire and set up his mosque in Agia Sofia.

Mohammed the Conqueror had not enough Moslem subjects to fill his empire or his conquered city, so he accepted his great body of Christian subjects with tolerance of their laws, customs, and religion. Many Turks today think that if he had pursued a policy similar to that of modern Russia and Germany, ruthlessly Turkifying and converting to Islam his foreign subjects, he would have made a homogeneous and happy Turkey. But he left the *Rayahs,* or Christians, contemptuously alone, granting them,

Photo by Stephen Van R. Trowbridge

KURDISH CHILDREN OF THE CITY OF AINTAB

however, no civil or military advancement unless they accepted Islam.

The Ottoman Empire was organized into *millets,* a religious division, there being an Orthodox millet, a Gregorian millet, a Catholic millet, and a Jewish millet, and in the nineteenth century a Protestant millet. Each of these millets has its head, who is its representative or ambassador at the Porte. This is not a purely ecclesiastical position, like that of the Catholicos, but is really a diplomatic and political office, and demands intellectual rather than spiritual qualifications.

PATRIARCH NOT ALWAYS RELIGIOUS

Therefore the patriarch of the Armenians is not necessarily nor by any means always a religious man, although an occasional patriarch, like Ismirlian, is worthy of great reverence. It is in this entanglement with politics, and in its ancient ritual in a dead language that lie the dangers to the Gregorian Church, namely, formality and lack of application to daily living. One of the best things that Protestant missionaries have accomplished in Turkey is revivifying this ancient and noble institution. It will readily be seen that when an Armenian leaves the Gregorian to join a Catholic or Protestant Church he in some sense loses touch with his nation, for nation or millet and church are practically one in Turkey. For this reason, if for no other, all missionary work within the church is better than that done outside.

Turkey governed very well, as governments went, in the first centuries of her rule, and the Armenians were not unhappy. They were not admitted to the army, but paid a head tax instead; but many of their men, cleverer than the Turk in finance, became advisers to royalty. The Armenians formed the body of industrious farmers in Asia Minor and were useful business men in the

Photo by Stephen Van R. Trowbridge

HAJI AGHA, A KINDLY NEIGHBOR AND A MOST LOYAL FRIEND TO THE AMERICAN HOSPITAL IN AINTAB

In the massacre of 1895 he posted himself at the hospital entrance and prevented the mob from entering. He represents the better type of Moslem, who are not responsible for the Armenian massacres.

coast cities, where they won respect and envy. They have always been loyal citizens of Turkey, but they have not become converts to Islam, nor have they voluntarily intermarried with the Turks.

One curious instance of their separateness from their political masters is in their use of the Turkish tongue. Although the Armenians have lived centuries among the Turks, and many have been brought up in the Turkish rather than the Armenian language, they seldom speak Turkish without a very strong accent, amounting to a mispronunciation. It is one of the ways in which they have preserved their national individuality. There is little, if any, racial antagonism between Armenians and Turks. Had religion and politics never come to antagonize them, they could live together in essential harmony.

ARMENIA'S GOLDEN AGE

The Armenians boast a Golden Age in literature, when for a brief cycle of fifty years their writers burst into poetry and song, leaving a precious heritage of literature to their descendants. This period was ushered in by Saint Mesrob, himself a scholar in Greek, Syrian, and Persian, who took the limited Armenian alphabet and perfected it to express the Armenian language. It had thirty-six letters, but two have since been added.

Photo by Stephen Van R. Trowbridge

A TURKISH VILLAGE CHIEF (FOURTH FROM THE LEFT) AND HIS RETAINERS

Probably no people in history, not even barring the Jews, have been the victims of such a relentless persecution as the Armenians in the past third of a century. Sometimes the storm has abated its fury, only to start up again with increased energy, and the present terrible era in Armenia is but the climax of a generation of terror. In 1893 some of the Armenians sought to throw off the Turkish yoke. The revolt was quelled, and thereafter followed a brutal massacre in which thousands of lives were lost. In June, 1896, a disturbance in Constantinople, carefully planned and engineered by Moslems, broke out, and before it wore itself out between 6,000 and 7,000 Gregorian Armenians had been slaughtered in Constantinople, and from 20,000 to 25,000 outside of the Turkish capital. The actual perpetrators of the massacre were the local Moslems, aided by Kurds, Circassians, and Lazis. The best Moslems opposed it, but the ignorant and fanatical masses were stirred by a report that the Powers were going to coöperate with the Armenians in driving them out. Furthermore, their cupidity was appealed to by the fact that they would thus be able to wipe out the heavy debts they owed to Armenian peddlers and merchants. Horrible as have been the Armenian massacres of previous years, they are surpassed by the terrible conditions of 1915. The world has never seen a more furious effort to drive out a people, or more cruel methods in their execution, than are now being employed against this unhappy race.

Mesrob, aided by Sahag, next translated the Bible into Armenian and furnished the translation that is still used in the Gregorian Church.

Sahag also wrote epistles to many knights and emperors, all of whom, we are told, reverenced him and were greatly influenced by the saint. He wrote a large part of the Armenian Church history and composed many hymns. Another great name of this period is Moses of Khorene, who wrote a history of Armenia which presents tradition, old stories and ballads, and some real history. Although it is full of mistakes, it was the only source of Armenian history for a thousand years and has much real value.

Another valuable contribution to the learning of the Middle Ages was the translation from the Greek of many classics, some of which, notably a part of the writings of Eusebius, were lost in the

Photo by Stephen Van R. Trowbridge

BEATING UP OLD COTTON: AINTAB

Mattresses and pillows are made over every year. The old cotton packing is fluffed, cleaned, and aired by means of a great bow and a tightly drawn gut which is struck with a mallet.

originals and preserved to the world only through the Armenian translation. The Armenians are very proud of this classic literature and teach it in all their schools. There is today a revival of Armenian literature, modeled in part on these revered classics and in part on French and English modern writings.

The Armenians have a sense of style, a flow of language that often makes for oratory and fine writing. The Armenian language is rich, but harsh and guttural. Scholars say that it is an Indo-Iranian tongue, unique in its development.

But the most beloved of Armenian heroes, dearer than the mighty Dickran or Tiradates, greater than Saints Sahag and Mesrob, was Vartan. The story of his brilliant youth and the favor of Constantinople and Persian court; of his strong manhood, tested by the fierce persecution of Christians by Persia; of his military genius and success, and of his heroic death in the final battle that won Persian tolerance for Christianity, is one that Armenians never tire of relating. What solemn enthusiasm the students of Constantinople College always brought to the observance of "Vartan's Day!" With what praises of their national hero did they fill their compositions, and what pride of race shone in their sparkling eyes!

THE ARMENIAN QUESTION

The "Armenian Question" was brought about by the entrance of Russia upon the stage. Toward the end of the eighteenth century the province of Karabag, peopled by 200,000 Armenians and 100,000 Mos-

Photo by Stephen Van R. Trowbridge

AN ARMENIAN FARMER'S FAMILY

"The purpose of the massacres seems to have been to reduce the number of Armenians and to take possession of their property" (see text, page 353)

lems, and governed by Armenian chiefs under the suzerainty of Persia, was conquered by Russia, so that Armenia is now divided between Persia, Russia, and Turkey. The Armenians in Persia have been treated well and are content; the Armenians in Turkey were enjoying fair treatment up to 1876.

But the trouble had begun, for Russia had framed a policy for the protection of the Rayahs of the Ottoman Empire and annoyed Turkey greatly by her intervention and demands for "reform." At first it was her coreligionists, the Orthodox Christians, Slav or Greek, whom Russia sought to protect, but later it included the Armenians.

In 1876 there came to the throne of Turkey one of the most cruel and abominable tyrants whom the world has ever known—Abdul Hamid II. Shortly after occurred the Russo-Turkish War. At the Treaty of San Stefano, that closed the war, the grievances of the Armenians were definitely put forward, and Russia engaged to carry out reforms "in the provinces inhabited by the Armenians and to guarantee them security against Kurds and Circassians."

When England forced the substitution of the Treaty of Berlin for that of San Stefano, she divided the responsibility toward the Armenians and weakened Russia's power to help them. In the Cyprus Convention of the same year, 1878, the Sultan promised Great Britain to introduce reforms for the Protestants and other Christian subjects of the Porte. The Armenians at this time got very strongly the impression that England was their friend and protector. Their disappointment was very great when they gradually learned that the policy of Gladstone was not the steady policy of Great

Photo from Hester Donaldson Jenkins

A GROUP OF ARMENIAN GIRLS AT THE AMERICAN COLLEGE FOR GIRLS, CONSTANTINOPLE, REPRESENTING VARIOUS TYPES OF THE ARMENIAN PEOPLE AT THE PAGEANT GIVEN IN JUNE, 1914

"As students, the Armenians differ among themselves, ranging all the way from dense stupidity to brilliance, but averaging high in their studies. Of the three students who distinguished themselves in philosophy in a dozen years, one was Turkish, one was Greek, and one Armenian. In English composition the stories showing the most grace and fancy were written by Armenians. Oriental girls rarely enjoy mathematics, but the one student who so craved mathematics that the professor in that department had to form special classes to give her all that advanced American college offer was an Armenian" (see text, page 337).

Photo by Stephen Van R. Trowbridge

ARMENIAN BRIDESMAIDS

"Hrypsimé ran off to join the Red Cross. When I asked whether her mother knew, she shrugged and said: 'My father gave his life for revolution; why should I try to save mine?'" (see text, page 341).

Britain, and that England was more anxious to maintain the "sick man" on his tottering throne than to help his oppressed subjects. One finds considerable bitterness against England among the Armenians.

A CONCERT THAT FAILED

The article in the Berlin treaty has remained a dead letter. No reforms were introduced, and the appeals of the Armenians and their friends in Europe have failed to move the Powers to effective action. The ironically named "Concert of Europe" has never been ready to act together. At one time Germany, and at another time Russia, refused to act; but between them they sharply irritated the Turkish sultan against his Armenian subjects, and he began a definite policy of massacre against these harmless and useful subjects. The massacre of 1895-'96, that at Van in 1906, are some of the familiar illustrations of this policy, and have been proved to have been decreed by authority. The purpose of the massacres seems to have been to reduce the number of Armenians and to take possession of their property. This policy has, of course, driven the law-abiding Armenians into revolutionary societies, which worked for the downfall of Abdul Hamid and have earnestly striven for the freeing of the Armenian provinces.

Independent of the massacres, which, alas, have been of too frequent occurrence, what are the grievances of the Armenians against the Ottoman government?

ARMENIAN GRIEVANCES

They may be divided into two classes: those which arise from the deliberate policy of the government and those

Photo by Stephen Van R. Trowbridge

ARMENIAN BRIDAL PROCESSION TO THE CHURCH

"Like the Jew, the Armenian has been oppressed and persecuted, and has developed a strength of nationality, a love for his own people, and a persistence of type rarely seen elsewhere. Like the Jew, he has learned to bend, not break, before the oppressor" (see text, page 335).

which arise from the weakness and inefficiency of the government. To the former class belong the massacres, the impoverishment of the peasantry by taxation, and the impunity granted to the crimes of Kurds against the Christians, together with the disarming of the latter and the supplying of rifles to the former. To the second class belong disorders, utter failure of justice, wretched and unsafe transportation, and brigandage.

In the courts of justice the word of an Armenian will not be taken against that of a Moslem. The Armenian peasant or trader has to pursue his calling knowing that he cannot travel freely in the empire, recognizing that he will be so heavily and so unfairly taxed that he can scarcely make a living, and then when the struggle of the year is nearly over perhaps the Kurds sweep down from the mountains and seize his home for their winter shelter, take his crops, and even carry off his daughters. No Armenian's life, his property, nor the honor of his women has been safe in Turkey for a century.

The misgovernment of Turkey has found, of course, other victims beside the Armenians. Patriotic Turks have seen their country impoverished, their people oppressed, their trees cut down, their mineral resources undeveloped, their government despised by Europe, and their patriots and statesmen exiled. But hard as was their lot, it was not so hard as that of the Christians, and of the latter the Armenians have suffered the most. The case of the Turkish people got so bad that in 1908 there broke

Photo by Stephen Van R. Trowbridge

ROLLING OUT BREAD AS THIN AS BLOTTING-PAPER AND BAKING IT ON A DISC OF SHEET-IRON

This is the universal custom of baking unleavened bread in Turkish homes

out in Turkey a revolution, in which all the revolutionary societies of the country joined with the Young Turk party to overthrow Abdul Hamid and establish a constitution.

A TOUCHING FAITH

The enthusiastic belief of the Armenians in this movement was very touching. In the halcyon days that followed the announcement of the constitution, priest and imam went together to place flowers on the graves of massacred Armenians. One of the illustrious exiles who returned to Constantinople was the venerable Armenian patriarch Ismirlian. As his boat came through the Marmora it was met by thousands of little boats coming out to welcome him. When they drew in sight of Seraglio Point, where the waters of the Bosphorus meet the Marmora, Ismirlian said solemnly: "Let us kneel and pray over the graves of our dead. Here below us in the Marmora lie thousands. Let us pray God for their souls!" and, kneeling, he led his sobbing people in prayer.

Many an intelligent Armenian went eagerly to the new Turkish parliament as delegate from his hopeful people. It was an Armenian who wrote the song of freedom called "Fatherland." One of the most moving sights of that wonderful day when the first parliament met was a body of several hundreds of Armenians marching through the streets of Stamboul singing this song of "Fatherland;" they who for a thousand years had not been allowed to feel that they had any fatherland.

An attempt to break down the civil inequalities of the population of the empire was made. All citizens henceforth were to take the name of Ottomans, and

Photo by Stephen Van R. Trowbridge

A STREET SCENE IN THE CITY OF MARASH

Marash is the principal city of the *sanjak* of the same name, not far from Aleppo. It is famous for its trade in oriental rugs and has a large Armenian population

the Rayahs were released from their special tax and allowed to enter the army. There were undoubtedly a good many changes for the better made after the constitution, but the old habits of corruption, of contempt for the Rayah, of leniency to the Kurd, and of general inefficiency remained. Armenians in 1909 were sadly shaking their heads and prophesying that the Young Turk party would fail, when came the counter-revolution, Abdul Hamid's attempt to repossess himself of the power. With supreme cunning he planned a series of massacres that should forever discredit the Young Turk party in Europe. In many cases the governors refused to execute the massacres, but in Cilicia they took place—a sickening succession of horrors.

The Armenians, infinitely saddened, reluctantly abandoned their hope of freedom through the Turk. Emigration began in considerable numbers to America, and in still larger numbers to Russia.

RUSSIA'S ARMENIAN POLICIES

Russia had long been the possessor of an Armenian question, too, and had sought to make Russians of its Armenian subjects in Transcaucasia. Its policy at first was one of russification. In 1896 Mr. Hodgetts quotes an Armenian priest of Etchmiadzin as follows:

"The great difficulty we Armenians have today is to get education. We are an ancient race, with a noble literature and a great cultural history behind us; but everything is being done to undermine that culture, to reduce us to the condition of brutes, to make us learn Russian, forget and neglect our own language, and thus become assimilated by Russia. But the Russians are intellectually, culturally, and racially our inferiors, and we mean to do all we can to retain our superiority."

In 1903 the Russian government despoiled the sanctuary of Etchmiadzin, carrying away coin and plate and taking over farms and lands belonging to the

Photo by Stephen Van R. Trowbridge

THE HOME OF A TURKISH VILLAGE CHIEF

These local officials often have winked at massacres; the masses delight in them, since it gives the Moslem a chance to divide up the property of the more provident Armenians

church all over the land; furthermore, Armenian churches were closed and their services forbidden.

The government next attempted to bribe the Armenians to join the Orthodox Church; but neither coercion nor bribe could turn the faithful Armenian from the church of his fathers. This loyalty can hardly be said to spring from religious principle; for, as we have said, the two great Eastern churches differ practically not at all; it was merely another expression of the intense national feeling of the Armenians. Bandied from one political rule to another, never knowing political independence nor unity, they have sought that unity in their church. When they were thus suffering persecution, a traveling American missionary asked them, "Don't you wish you were still under Turkey?" And the reply came, "Yes; for Turkey lops off our branches, but Russia digs us up by the roots."

But in 1904 a new viceroy took the government of Russia and the policy was completely changed. The property taken was restored to its former owners, the Armenian Church was once more free, and with the freedom of the church has come the freedom to use their dearly loved vernacular and to maintain their excellent schools. The Armenians of Turkey, noting the improved conditions of their brothers in Russia, are emigrating thither in flocks, and at the outbreak of the present war in Europe many went over the frontier to offer their services to Russia, and many more are watching with eager hope the progress of the Allies at the Dardanelles.

AMERICANS MAKERS OF ARMENIA

If the Powers have done little for Armenia but raise false hopes, that is not true of the people of Europe and America. French missions are dotted all over Asia Minor, and German societies have

Photo by H. S. Cresswell

IN CONSTANTINOPLE ALL PARKS AND OPEN PLACES ARE NOW USED FOR THE MILITARY

"The Armenians state their desiderata thus: 'An Armenian administration in Armenia; the provinces of Van, Erzeroum, Diarbekir, Bitlis, Kharput, and Dersim to be grouped into one province, with an Armenian governor and an established gendarmerie'"

Photo by Stephen Van R. Trowbridge

TURKISH BOYS IN THE LARGE AND PROSPEROUS VILLAGE OF KIZIL HISSAR

Turkey has a total war strength of nearly 2,000,000 soldiers. The mobilization of 1914 brought out 750,000. Christian subjects generally are employed on transport and fatigue work.

OUTLINE MAP SHOWING THE APPROXIMATE EXTENT OF ANCIENT ARMENIA (THE AREA INCLUDED WITHIN THE DOTTED LINE) AND THE COUNTRY WHERE THE ARMENIANS NOW LIVE

cared for children orphaned by the massacres, while English missions, schools, and orphanages attest a deep interest in the Armenians. But the greatest work done among them has been done by the Americans, whose schools and hospitals, says an Englishman, "might almost be called the makers of modern Armenia."

The American mission schools at Marsovan, Adabazar, and scores of other places are filled with Armenians, and the men's colleges at Constantinople, Smyrna, Beirut, and elsewhere, and the women's college at Constantinople graduate each year numbers of eager, intelligent Armenian men and women.

The American Board of Foreign Missions, through its hospitals, kindergartens, schools, colleges and churches, its Bible societies and its press, has done an enormous work for the Armenians. These institutions have generally been open to other dwellers in the land; but the Armenians in their love for education have always been the first to profit by any school or literature at their doors Often, also, they have been able to take the work started by the Americans and carry it on themselves, financing and administering it.

ROUMANIA, THE PIVOTAL STATE

By James Howard Gore

ANTIQUARIANS have for many years looked upon the country lying in the half embrace of the Carpathian Mountains as a field for pleasing speculation. Some find here the home, if not the birthplace, of the Aryan race, and while they realize the impossibility of fixing dates, even with the accuracy of a century, the less imaginative, though more cautious, student of race migrations can give in sequence the movements of peoples for twenty-five centuries, at least, over the territory now generically termed the Balkan States.*

They tell us that this region, in common with the rest of Europe, received its first blessings of civilization from the Orient, brought thither by the Phœnicians, the great merchants of antiquity. This civilization, after its development in Greece, spread westward and northward, infusing new life in its onward sweep, until Macedonia and Rome fell under its sway, and the great expanse lying immediately north of the Bosphorus and Hellespont, across the Danube, even to the foot-hills of the Carpathians, yielded in lessening measure with each advance to its beneficent influence.

* For a map see "Map of Europe," 28 x 30 inches, in 4 colors, published as a supplement to the August, 1915, number of the National Geographic Magazine.

With growth of power, both Greece and Rome sought new lands to conquer; Greece spread over the adjacent countries, while Italy, restrained on the east by the Adriatic, moved northward and thence to the east until the Danube Valley was practically Romanized, and Trajan's colony became so important that he gave to it a part of his own name and called it Dacia.

ROMAN ENVY

The fertility of the soil, added to the increasing commerce and its natural fortifications, proved so attractive that migration thither aroused the envy of mother Rome. Roman life, Roman usages, and Roman civilization covered like a sheet both banks of the Danube and became so firmly fixed that the whole region was like a lesser Italy.

To this day Latin monuments and inscriptions are found, the language spoken in some of the isolated districts reveals its Roman origin, and the name, Roumania, acknowledges its parentage; also the people, out of fancied resemblance to the great emperor, have preserved his name in "Trajan's Table"; and "Trajan's Prairie" and the "Road of Trajan" is their designation of the Milky Way.

A more material road of Roman origin, begun by Domitian, still exists along the

Photo by E. M. Newman

WORKERS IN THE FIELDS OF ROUMANIA

"The fertile soil of Roumania has been the source of its great prosperity, and at the same time the cause of most of its troubles. The Roman invader distributed large tracts to favorite veterans, and many estates to this day, in their designation, bear testimony to the fact that they at one time were the rewards of service to the Roman soldiers" (see text, page 365).

right bank of the Danube as far as a point opposite Orsova. In some places the road was hewn through solid rock, and in others, where the steepness made it impossible to cut a step-like way, a swinging shelf of planks formed the roadway.

The exploits of the Romans in conquering Dacia have been handed down to us by the vain Trajan, who had erected in the Italian capital the column that still bears his name. Apollodorus, the architect, has epitomized his master's conquests in the groupings of the 2,500 human figures that decorate this monument. His body is supposed to lie beneath; his statue once crowned its summit; but years ago the piety of the popes replaced it by one of St. Peter.

GOTH AND HUN INVADERS

The prosperity of this thriving Roman colony was destined to awaken covetous feelings, and, with the first signs of Rome's weakening, her outlying possessions became subject to attack; and the Dacian province could not hope to escape. By the middle of the third century, the Goths had invaded the Danube territory, and close upon them were the Huns, who, under Attila, were the masters of central Europe from the Rhine to the Volga.

These were the beginnings of the Germanic invasion, which, with the Mongolian incursions that followed, surged back and forth for ten successive centuries, uprooting from their very foundations Roman institutions and Roman civilization, and driving all who resisted into the fastnesses of the Carpathians, where, for a thousand years, the ancestors of the present Roumanians led a wandering pastoral life, handing down to the succeeding generation the tradition of their glorious past.

It is claimed that a people who have

Photo by Erdelyi

NATIVE ROUMANIANS OF WALLACHIA

Roumania is as large in area as Arkansas, but it has nearly six times as many people as that State

earned by continual struggle the right to live are always patriotic. If this be true, the many conflicts waged by the races occupying the Balkan States would place them high in the scale of love for native land, were it not for the fact that the most serious conflicts have been internecine.

TWO PRINCIPALITIES UNITED

While it would be interesting, though perhaps tedious, to narrate the tribal and factional wars of this region, the section now especially under consideration can be quickly reached by saying that the treaty of Paris in 1856 gave recognition to the two principalities—Moldavia and Wallachia—and empowered each to elect a ruler.

It was specified that the election in the two principalities should take place on the same day, but, in the absence of any stipulation to the contrary, the electors wisely selected the same man—Cuza—who, under the name of Prince Alexandru Joan I, ruled rather ingloriously until forced to abdicate by the revolution of February, 1866. Though he achieved but little else, he can claim some credit for the *coup* which resulted in the coalition of the two principalities, whereby a new nation came into existence with the name of Roumania.

Photo by Frederick Moore

A RURAL VILLAGE IN ROUMANIA

"Roumania contains 53,489 square miles, an area slightly greater than England and Wales and only a little less than Massachusetts and New York combined. Within this territory there were, according to the last census, 7,508,000 inhabitants, or 140 persons to the square mile. This is a density of population slightly greater than that of Maryland" (see text, page 365).

ROUMANIAN CHILDREN

A boy and a girl are not accounted grown up before their first dance. "She dances at the dance" is the Roumanian way of saying that a girl is a child no more. At fifteen or sixteen the Roumanian girls begin to heed the national proverb, "Wed young, eat early."

HELPING THE PHOTOGRAPHER: ROUMANIAN PEASANTS

TYPES OF ROUMANIAN PEASANTS

The patriotism of the Roumanians living outside of the political boundaries of the country was illustrated during the National Exposition at Bucharest in 1906, when the authorities organized a number of "home-comings," setting aside a certain day for the visitation from each of the extra-Roumanian localities. Thousands of those living in Hungary and elsewhere came back home and took part in the gala exercises.

His successor was Prince Charles of Hohenzollern—a selection that did not meet with the approval of the allied powers that made possible this new kingdom—but before they could formally and unitedly protest the new prince regent was safe within his new dominion. It is a tradition that he made this hasty move under the advice of Bismarck, who suggested that even if he should be obliged to lay down his newly acquired scepter, it would be for him "an interesting experience and a pleasing souvenir."

DEFEATED TURKS AT PLEVNA

Prince Carol, the Roumanian equivalent for Charles, gave new life to a people who had known only the heel of the oppressor, and instilled such a vigorous spirit of nationalism into all classes that when he, in answer to Russia's pleading, defeated the Turks at Plevna, they acclaimed him King, and the sovereigns of Europe, with varying degrees of reluctance, recognized him as worthy to wear a kingly crown, made in this instance from a Turkish cannon.

His nephew is now on the throne, and, being one degree further removed from foreign allegiance, he may be said to be by that same amount more Roumanian. Time alone can tell.

Because of the kaleidoscopic changes that take place in this part of Europe, it is almost unsafe to give the metes and bounds of any of the constituent States. But the last word has it that Roumania contains 53,489 square miles, an area slightly greater than England and Wales and only a little less than Massachusetts and New York combined. Within this territory there were, according to the last census, 7,508,000 inhabitants, or 140 persons to the square mile. This is a density of population slightly greater than that of Maryland.

As a result of the shiftings of boundaries, there are at the present time practically half as many Roumanians living under the Austro-Hungarian flag as there are under their own. In Transylvania 60 per cent of the population are Roumanians, while Bukovina has nearly one million, and more than that number make their home in Bessarabia.

ETHNICAL BOUNDARIES DISREGARDED

Impersonal and inhuman diplomacy has taken no account of language and feeling as a basis for boundaries between people that are one in spirit; but while it threw beyond the fictitious wall persons ethnically allied to those within, the State, by way of compensation, gained no little security from the fact that beyond the political frontiers the kingdom is girdled round by Roumanian communities.

The State that seemingly gained by the inclusion of an alien race has had its administrative difficulties greatly increased, for a people so devoted to their own land, its customs and government, cannot easily be assimilated by another.

This patriotism was shown during the time of the national exposition at Bucharest in 1906, when the authorities organized a number of "home comings," setting aside a certain day for the visitation from each of the extra-Roumanian localities. On these occasions the visitors, wearing the native costume or the dress of their province, were received by the municipal authorities upon their arrival at the station and escorted through the decorated city to the exposition grounds, where entertainments of many sorts awaited them.

The older people were encouraged to come, and carriages were at the disposal of those who could not walk in the procession, or who, attempting to walk, found their strength insufficient. No one could look on these festivities without a feeling of conviction that patriotism such as this is an asset of great value to the native land if their possessor live within it, but a liability of grave concern when the home is on alien soil.

PROSPERITY AND TROUBLE

The fertile soil of Roumania has been the source of its great prosperity, and at the same time the cause of most of its troubles. The Roman invader distributed large tracts to favorite veterans, and many estates to this day, in their designation, bear testimony to the fact that they at one time were the rewards of service to the Roman soldiers.

Photo by E. M. Newman

ROUMANIAN PEASANTS AT A FAIR

"To wear store-made clothes was, until recent times, a token of indolence or awkwardness on the part of the females of the family—characteristics that are the butt of most of the jokes improvised by the leader of the Sunday village dance" (see text, page 375).

Later conquerors quarreled over the division of the soil—the most valuable booty available—and in their greed gave the farmer peasant but little for his labors. Even after stable government was secured, the easy method of collecting taxes by farming them out placed such burdens upon the poorer classes that they were obliged to relinquish their lands to persons better able to pay the taxes or influential enough to avoid them.

The continuance of this process threatened to eliminate the peasant farmer and increase to a dangerous point the holdings of a few. In 1821 this fear became acute, and steps were taken to ameliorate the condition of the agricultural classes. This movement was accelerated by the revolution that swept over Europe in 1848—a revolution that was social rather than political—and finally culminated in a new code of laws relating to land tenure, by virtue of which 400,000 persons received allotments of land, and ultimately 48,000 bridegrooms were given ground upon their marriage.

COMPLICATED LAND OWNERSHIP

The land question has been complicated by the alien ownership feature, the inhibition of land ownership by Jews, and the greed of tenants who are themselves renters. Still the government has acted with such wisdom that out of 33 million acres of arable land the small farmers have a little more than one-third, while the large proprietors have 13 million and the State 6 million. The lands held by the State, known as Crown domains and consisting of 12 estates, exercise great influence as model establishments.

On these, both field operations and large industries are carried on, many small trades established for adults, and schools conducted in such a way as to stimulate imitation. Conservation of natural resources is taught by precept and example, and forestry, which was a hobby of the late King, found a quick response from the peasants, who affectionately call the oak his brother and the

Photo by International Press Photo Company

WEDDING CEREMONY IN ROUMANIA

"When there is a wedding, the horses weep three days beforehand," says a proverb of the Roumanians. This proverb comes from the fact that in the country there are many contests of speed between the riders in the groom's party and those in the bride's party.

Photo by E. M. Newman

NOT THEIR WORK-A-DAY DRESS

Approximately 86 per cent of the population of Roumania reside on the land, with the result that crop failures occasion great distress

Photo by International Press Photo Company

ROUMANIAN BEAUTIES IN THE NATIVE COSTUME

"The most important thing about the costume is the fact that it is entirely made at home by hand, so that the dress exemplifies both the taste and skill of its owner, and gives to the mate-hunting swain an index to these all-important qualities" (see text, page 369).

elm his first cousin. In passing, it might be said that lumber in various forms ranks fourth in the list of Roumanian exports.

Of equal importance has been the systematic endeavor to have the peasants properly housed. Beginning in the Crown lands, a decree has fixed the type of houses that can be built; it prescribes the minimum amount of light and air, and the officials charged with the enforcement of these regulations are required to give advice to neighboring peasants who desire to build. Many of the large land owners are emulating the example of the directors of the Crown lands, and in various sections of Roumania one may find villages of peasant farmers that cannot be surpassed for comfort and neat appearance.

A Roumanian village looks its best in the spring, when nature, awakened from the sleep of winter, is green and fresh. At Easter the cottages have been whitewashed and the door and window frames freshly painted in bright colors. The thatched roof has been put in order, and in its entirety the cottage calls to mind the black-eyed country girls, with their glistening strings of multi-colored beads around their necks.

ROUMANIAN PEASANT WOMEN

This rudely drawn picture will bring to the minds of all who have visited Roumania the vision of some of the peasant women met by the roadside. It will be recalled that they are the fairest among their neighbors, and that this natural gift is most apparent under conditions best calculated for its preservation. Their dress is varied and elaborate. The foundation is a sort of shift, reaching to the ankle, the upper part embroidered with colored cotton, usually red or black. Over this is a petticoat, which, in its material and detail, reflects the taste and buying power of the wearer.

On her head the peasant woman wears a scarf of cotton tissue with silk stripes, if her means permit, and on gala occasions she puts on a brighter kerchief, ornamented with a fringe or a row of spangles.

Both men and women seem partial to having their heads covered, even in the house; but it is not regarded proper to eat without removing the hat.

The most important thing about the costume is the fact that it is entirely made at home by hand, so that the dress exemplifies both the taste and the skill of its owner, and gives to the mate-hunting swain an index to these all-important qualities.

In no part of Europe do the peasants hold so tenaciously to their distinctive costume as in the uplands of Roumania. It is, in fact, almost an asset in nationalism, and its unifying influence was emphasized some years ago by the present Dowager Queen, when she herself put on the native dress.

ESSENTIALLY AN AGRICULTURAL COUNTRY

Roumania is essentially an agricultural State, and for the peasant no work is so attractive as farming. The rich soil insures a good return for his labor, and crop follows crop without demanding repeated fertilizing. It is confidently asserted that there are estates which, although long under cultivation without a single manuring, continue to yield twenty-five bushels of wheat per acre, while other tracts, more scientifically handled, produce as much as thirty-six bushels to the acre. It is because of this fertility that the Danubian States rank with Russia, Argentina, and the United States as the chief wheat-growing countries on the globe.

On the other hand, since 86 per cent of the population reside on the land, crop failures occasion general distress, and Roumania will continue to suffer from economic depressions as long as she remains exclusively dependent upon each recurrent harvest, and looks to foreign countries for even the most trifling products of the manufacturing industries.

The soil is equally adapted to corn (maize) and would be called upon for greater crops if the demand should justify it. The ease with which corn can be converted into sustaining food tempts the people to give but little attention to the form in which it is prepared for consumption.

Polenta, a sort of mush, can be made of corn-meal and water, and if time or

Photo by Erdelyi

ROUMANIAN WOMAN WITH SPINDLE

After the sheep are shorn the wool comes into the women's hands; after varied processes of washing, combing, and spinning, the worsted is woven into all sorts of carpets, blankets, coverlets, and clothing.

energy be lacking, it will be placed on the table insufficiently cooked. Although many believe that this is the cause of the greater part of the pellagra so common in Roumania, it is difficult to persuade the peasant to exercise greater care in the preparation of polenta or substitute for it some of the many palatable dishes that can be made from corn.

INTRODUCING AMERICAN CORN

It was for the purpose of improving these conditions that I introduced into Roumania a type of corn better suited to her soil and climate, showed the peasants how to improve their meal, taught them — through my wife—to prepare a variety of dishes from corn in its different forms, and compiled for their use a

ROUMANIAN SCHOOL-HOUSE

"Although an act passed in 1864 endowed Roumania with free and compulsory elementary education, the services of the children were deemed so necessary for doing the work around the house that the schools were slimly attended. . . . Then, too, the absence of any disrespect for illiterate parents prompted many to feel that education has but little efficacy in the social uplift" (see text, page 384).

A COUNTRY-SIDE SCENE IN ROUMANIA

Photo by Erdelyi

INTERIOR OF A WALLACHIAN HOUSE

No Roumanian housewife dares be lazy and few of them are inclined that way. A woman who does not do her family laundry regularly is likely to hear everybody at the neighborhood dance reciting for her benefit lines like these: "Green leaf of a tulip, how industrious my wife is! She set the pot for the washing and grass has grown underneath!"

collection of recipes to be printed for gratuitous distribution. Some benefits must have been the result, for three years later—the intervening time having been sufficient to afford a test—we were decorated for "distinguished services to the kingdom."

The government has established a system of agricultural syndicates whose members may acquire, by payment on the installment plan, implements and superior wheat and corn for seed; and the crops can be sold through the association directly to the consumer or to a wholesale dealer without passing through the hands of middlemen. The various provincial syndicates are placed under a central organization sufficiently close to the national bank to have command of the funds required.

PLANTING BY SIGNS

It is undoubtedly true that the fertility of the soil and the ways of working it are large factors in determining the magnitude of the crop, but a good harvest depends very much upon the weather, and the anxious farmer is always concerned for fear that it may not rain in time, or that it will not stop raining, or that the ripening grain may be beaten down by hail.

To relieve this anxiety, he has formulated a number of signs in which not only the moon, but all nature, takes part. Thus, when the sparrows flutter about, chirruping; when the cattle show nervous restlessness and the forest gives forth unusual sounds; when the cock crows all day long, the ducks thresh the ground with their wings, and the frogs croak incessantly; when the mist rises, the sun sets in a cloud, and your ears itch, there surely will be rain.

When, on the other hand, the sparrows take a bath in the dust, when the storks stand quietly in the field, the lambs gambol gaily, and the cat, after washing her face, looks at the door, there will be fine weather.

But when the sparrows are hurrying about looking for shelter; when the lark dashes against the window; when cattle bellow, looking up into the air, and the pig goes about with a straw in his snout, then a storm is threatening. These are some of the evidences of weather changes, but it is possible, many believe, to bring about the desired change, such as stopping a disastrous rain, by interring a doll at the cross-roads or throwing into a well some holy image.

However, unfavorable weather conditions are noticed only in bad years; at other times the farmer will tell you, "When God gives, there is plenty for man and beast."

The women, too, have their signs and omens, and these are associated with the moon. A brooding hen is not to be set on her eggs at new moon, because the chickens then will waste their energy in shrieking; the hair is not to be cut during a waning moon, for then it will fall out. The whitewashing of the walls, on the contrary, should be done during a waning moon, for then the troublesome insects will be killed.

The sowing of seed is also regulated by the moon. If the root is the important part of the plant, the seed should be sown during a waning moon; but if the part outside of the earth is to bear fruit, the sowing should be done during a waxing moon.

A LAND WITHOUT A SPRINGTIME

The climate is not so mild as might be expected from the low latitude of the land, it being the same as that of northern Italy. Coming under the influence of the Mediterranean on the west and the mountains to the north and east, the kingdom is subject to the extremes of a subtropical summer and a winter of the Hungarian plains. "Roumania," says Carmen Sylva, "has only three seasons, and of these one alone—autumn—is fine; in these parts there is no spring."

The Roumanian is not a tradesman, and his main interest lies in farming. Even the selling of the surplus grain usually takes place at his farm to itinerant buyers, for he seems to be wary of the town merchant, and rarely trusts himself to the wiles of the city, except on the occasion of the annual fair. But still he is an industrialist in his own way, and almost everything about the house—even not infrequently the house itself—is of

Photo by E. M. Newman

BAREFOOTED PEASANT WOMEN OF ROUMANIA

"Cooking, unfortunately, is not cultivated as it should be. . . . So few Roumanians have gardens that they are called *bulgarii,* since the greater part of the vegetables grown are in the hands of immigrant Bulgarians" (see text below).

his own handiwork. It would seem that with some encouragement and a little training the village industries could be greatly improved, possibly to such an extent that the balance of trade would rest permanently in Roumania's favor.

The great industrialist in the peasant's home is the housewife. Within the house she is complete mistress, and the greatest help she can expect from her husband is limited to splitting an occasional armful of wood, milking the cow, or fetching a pail of water. First of all, she must prepare the morning meal; then the house must be swept, after having sprinkled the floor to lay the dust.

"STAINING THE SUN'S FACE"

The sweepings are thrown out on the rubbish heap and covered by the accumulations of previous days, so as not to "stain the sun's face"; for if this should be done in summer, the sun might, in revenge, burn up the crops, or, in winter, cause suffering by excessive frosts. If the stress of work should defer the sweeping until evening, the rubbish is not removed before the next morning, otherwise the cows would lose their calves.

Domestic duties follow in close order, and the few hours left free by housework are claimed by harder labor in the fields, where she "makes a hand" at everything except loading hay, for which she is not presumed to have the requisite skill.

Cooking, unfortunately, is not cultivated as it should be, and the people seem to be content with simple fare and a sameness that yields but little to the seasons. Gardening is looked upon as petty farming and not worthy of the attention of a man who calls himself a farmer; in fact, so few Roumanians have gardens that they are called *bulgarii,* since the greater part of the vegetables grown are in the hands of immigrant Bulgarians.

As a contributing cause to better health, as well as in the interests of economy,

Photo by E. M. Newman

MEN OF THE WORKING CLASS

"Another economic weakness arises from the fact that the rural population, which works so arduously during the summer, has practically nothing to do in winter. During the idle months they spend for daily necessities all they earned when work was plentiful" (see text, page 376).

the use of vegetables should be encouraged, especially since the soil and climate are adapted to a range as wide as can be found in our Middle Atlantic States. Beans, however, are in favor, for meal made from dried beans furnishes the basis for the dishes used on fast days; but potatoes do not have the popularity they deserve.

FROM SEED TO GARMENT

Some of the outdoor work is almost wholly in the hands of the woman. She takes the hemp and the flax from the seed to the finished garment, and deems herself fortunate if the husband plows for her the ground. As the spinning and weaving is done by the women, the clothing worn by the family are tangible evidences of the taste and industry of the women-folk.

To wear store-made clothes was until recent times a token of indolence or awkwardness on the part of the females of the family—characteristics that are the butt of most of the jokes improvised by the leader of the Sunday village dance.

While these remarks apply primarily to conditions in the country, the fact that only 14 per cent of the entire population live in the 71 towns of Roumania suggests that they may be accepted as applicable to the land.

In this connection it should be stated that in Roumania there is an exceptionally clear line of demarkation between the rural and the urban population. To escape the isolation inherent in large estates, their owners live in the cities or larger towns. This more intimate association stimulates social rivalries, and polish is sought in travel and foreign

schools, with a decided preference for France.

Thus it happens that the higher classes, without distinction as to politics, the descendants of the Boyars—the landed aristocracy—as well as the rich citizens, use, in general, the French language in their daily intercourse, reserving the Roumanian tongue for those cases where it is prescribed by law—in the parliament and the law courts. As this restriction does not affect the women, those of higher rank take but little interest in the native melodious Roumanian and would not deign to write the least important note in that language.

FRENCH *vs.* GERMAN

Against this Gallicizing of language, as well as of habits and customs, a reaction has developed, and attention is being directed to the rich literature in prose and verse, based on the Roumanian folk-lore. The proximity to Austria, and Vienna, her alluring capital, and the influence exerted, however unintentionally by the Hohenzollern ruler and his accomplished Queen, bring the German language to the Roumanians as a second competitor.

Because of these distracting agencies, Professor Xinopel, of the University of Jassy, never concludes a lecture, no matter what may be the theme, without impressing upon his students their obligation to use and develop the language of their fatherland. Evidently this propaganda is meeting with some success, as may be inferred from the forcible interruption by Roumanian students of a play given in French by a ladies' charitable organization in Bucharest.

This outburst, resulting in a riot that kept the city in a state of siege for four days, was not because of any animosity toward the French people or their language; it was simply a mark of their greater love for Roumania and her tongue. It will be remembered that at one time during the Franco-German War the people of Bucharest expressed themselves so violently against Germany that Prince Charles felt impelled to declare his intention to abdicate—a resolution he fortunately did not execute.

HER ENTIRE PUBLIC DEBT IN GERMAN HANDS

But, on the other hand, France has frequently shown an indifference to Roumania's wishes. Thus, in the Congress of 1878, it was one of the French delegates who, against the protests of the Roumanians, secured the adoption of a measure granting equal rights to the Jews—a proposition, however humane, that was exceedingly unpopular with all Gentile classes. Seven years later it was a Frenchman who proposed that the policing of the Danube be intrusted to Austria, and years after Roumania had been declared an independent State France refused to conclude with her a commercial treaty, on the ground that she was still under the suzerainty of Turkey.

The economic relations of Roumania present a number of anomalies. Almost her entire public debt is in German hands, and from that country she imports annually goods to the value of 35 million dollars, while her exports to Germany are only one-seventh that sum. From Germany come war material and a small amount of machinery, and this is only partially paid for with food products.

To France she sends five million dollars' exports and makes, in return, purchases amounting to twice that sum. Belgium equals France in her imports from Roumania, but she sends in return exports having the colossal value of fifty million dollars. It is true that a very large part of the goods coming from Belgium did not have their origin there, but had simply passed through that busy country with the place of manufacture unnoted.

With the balance of trade against her in such a large measure, it is evident that Roumania must develop her home industries to avoid financial difficulties. Even if raw materials should be lacking, it would be quite possible to buy them with her present exports, and probably, in addition to meeting her own necessities, to enter foreign markets now unknown.

Another economic weakness arises from the fact that the rural population, which works so arduously during the

ALONG THE RAILROADS OF ROUMANIA

"The railway system has developed somewhat slowly, due, perhaps, to an unwillingness to displace the efficient team-freighting from which so many peasants derived a livelihood. Still there are now within the State 2,333 miles of line, of which the government owns 2,100 miles" (see text, page 383).

RESTING BY THE ROADSIDE

Photo by E. M. Newman

ROUMANIAN GIRLS ARE GREAT BELIEVERS IN SIGNS

The Roumanian peasant girl determines whether she and her lover are destined to get married or not by taking two pig bristles and laying them on a cleanly swept hearth. If the heat causes the bristles to curve toward one another, they will be married; if away from one another, they will never marry.

summer, has practically nothing to do in winter. During the idle months they spend for daily necessities all they earned when work was plentiful.

This periodic derangement of receipts and expenditures is intensified by the influx of thousands of Serb and Bulgar workmen coming in response to the demand for help for the harvest and for any unusually heavy construction work in the larger cities. The earnings of these itinerant laborers are sent out of the country.

UNIVERSAL MILITARY SERVICE

It is rather strange that the compulsory and universal military service has not stimulated manufactures in Roumania as it has in the Germanic countries, whose military systems the Roumanians have so closely followed. It is not because this service is distasteful to the Roumanian; for while he does not have by nature a war-like spirit, his great love for his country makes him ready to strike and receive blows in her defense.

All young men between the ages of 19 and 21, unless physically incapacitated, receive at home or in the schools preliminary military training. At twenty-one the active service with the army begins with two years' drill in the infantry, followed by three years in the other arms of the service. After that, for five years, the full-fledged soldier is listed in the first line of reserves, then in the second line, until he reaches the age of thirty-eight, when he is transferred to the territorials, or militia, where, during the next four years, he must stand ready for a call to the colors.

It is true that all availables are not called out for the entire periods named, but those exempted by lot are listed in the supplementary service and must, under the guidance of competent officers, be prepared to respond to any emergency.

ARMY THE COUNTRY'S PRIDE

The roster of the standing army calls for two hundred and ninety thousand men, armed with Mannlicher rifles.

Under stress of war this number could be largely increased. With her limited seacoast — about one hundred and fifty miles—Roumania has not felt impelled to build up a navy, but has been satisfied with a single protected cruiser, a few patrol boats, some torpedo boats, and a number of monitors for service on the Danube.

The army is the pride of Roumania, and its efficiency, demonstrated on more than one occasion, is a tribute to the organization, direction, and training of the late king.

The Roumanian peasant feels that with the discharge of his military service and the payment of taxes he has, roughly speaking, done his duty to the State. By way of recompense he looks for all sorts of paternal care: justice, religious direction, medical aid, and education.

The constitution clearly states in its tenth article that "there exists no difference of classes whatever in Roumania," but it is clearly recognized that all are not equally qualified to take part in the administration of public affairs. Thus every peasant, on reaching his majority, if not a pauper, can vote: but unless he pays an annual tax of sixty dollars, at least, he votes for a delegate, who, for each fifty voters, casts a single ballot for a deputy—not for a senator. The property qualification and the educational attainments make the suffrage system rather complicated for those above the peasant class.

The proposition to modify these regulations is one of the few questions that are brought before the electorate in the campaign speeches. However, all have an equal voice in electing the mayor and the communal officers, and, as these officials come closer to the voter, greater interest in their selection is felt than in the choice of the legislators, who, in far-away Bucharest, enact their laws.

ROUMANIA'S LEGISLATORS

The senators, of whom there are one hundred and twenty, are elected for eight years and receive, while in session, four dollars a day. In this number are included two for the universities, eight bishops, and the heir apparent, after he has reached his majority. To be eligible for a seat in the senate a man must be more than forty years of age and have an annual income of at least eighteen hundred dollars.

Photo by E. M. Newman

STREET VENDER: BUCHAREST

The chamber of deputies is made up of one hundred and eighty-three members, elected for four years. The deputy must be more than twenty-five years of age. He receives the same compensation that is paid a senator.

It is a pleasing commentary upon the law-abiding spirit of the Roumanians that history records the fact that the first book printed in their language on Roumanian soil was a collection of canon law, which appeared in 1640. Prior to this Roumanian was simply a vernacular, with Slav as the language of literature; but henceforth books in a tongue the people could understand served as a binding and unifying force.

For administrative purposes Wallachia is divided into seventeen districts, Moldavia into thirteen, and Dobruja two, each having a prefect, receiver of taxes, and a civil tribunal. The lowest court of

MODERN ARCHITECTURE IN THE COUNTRY'S CAPITAL

"The other cities of Roumania are deficient in interest and the monuments are rare and commonplace. Some of the river ports are centers of extensive trading in grain, but the business is so largely in the hands of the foreigners that they retain but little that is peculiarly Roumanian" (see text, page 387).

ROUMANIAN MANNER OF SELLING FRESHLY KILLED LAMBS

The Roumanian butcher shop is very often a perambulatory one, and much more meat is eaten in the cities than in the country districts where it is grown

ROUMANIAN SOLDIERS MARCHING THROUGH THE STREETS OF THE CAPITAL

Although the Roumanians express the hope that the wilderness may eat the flesh of him who devised soldiery, as far as the love of land goes and readiness to strike and receive blows in its defense, history bears witness that the Roumanian has ever been a patriot and a brave man.

law is held by the mayor of the village, and small differences are adjudicated by him and his councilors in a patriarchal way. A second court is presided over by "judges of the peace," of whom there is one in each district; while the highest courts, held only in the larger towns, are, because of the attending costs, resorted to only in matters of great importance.

For criminal cases jury trials are held twice yearly. As indicative of the gentle nature of the Roumanian, it should be said that serious crimes became so rare that the death penalty was eliminated in the new constitution, and long sentences are the exception. The salt mines furnish a working place for convicts, where, under excellent sanitary conditions, they

Photo by E. M. Newman

THE MAIN BUSINESS STREET IN BUCHAREST

Bucharest has a population of about 300,000, of whom 43,000 are Jews, 35,000 Hungarians, and 2,500 Germans. From a distance the many gardens and gilded cupolas give the city a very picturesque aspect.

can be employed with but little force for guarding, and at a labor that is remunerative to the State.

MOUNTAINS OF SALT

The salt deposits of Roumania cover an enormous area and have a thickness varying from six to eight hundred feet. At Sarat there is a mountain of salt, and steam-shovels can be used to load the waiting cars. In other cases the gallery system is employed, and electrically driven machines turn out blocks a cubic yard in size, like great pieces of granite. These have to be ground up and purified before it becomes the salt of commerce. A visit to the great chambers that have been excavated and the storehouses filled with the marketable product will allay all fears of a salt famine.

Another source of wealth are the vast oil fields, which send abroad each year products having a value of eight million dollars. The only export that surpasses this figure is the grain, which amounts to nearly two hundred million dollars annually. The oil wells are, to a great extent, owned by foreign companies, and, while a large part of the profits go abroad, the royalties and the money paid for labor add to the wealth of the kingdom.

Roumania's natural trade route is the Danube, which traverses the land for a distance of five hundred and ninety-four miles—thirty-five per cent of its entire navigable length. At the head of the deep-sea navigation stands the great commercial city of Galatz, with its population of seventy-two thousand. It is here that the Danube Commission has its headquarters. This organization is intrusted with the execution of such works as are necessary for the maintenance of the navigation of the Danube, the regulation

Photo by E. M. Newman

THE RUSSIAN CHURCH IN BUCHAREST

"Nearly five and a half million of the King's subjects belong to the Orthodox Greek Church. This is such a preponderating majority that religious questions do not arise to complicate the political situation beyond the ever-present position of the Jew in the economic life" (see text, page 384).

of the river, and the removal of obstructions.

ROUMANIAN RAILWAYS

The railway system has developed somewhat slowly, due, perhaps, to an unwillingness to displace the efficient team-freighting from which so many peasants derived a livelihood. Still, there are now within the State 2,333 miles of railroad, of which the government owns 2,100 miles, the remainder being operated as a part of the State system. In normal times there are excellent through express trains from Ostend, via Bucharest, to Constanta, where quite palatial steamers can be taken for Constantinople.

The peasants are entitled to medical attention, and the State provides a physician for each *plasa,* or subdivision of a district. Unfortunately, home remedies, usually of mythical virtue, have such a hold on the people that they will not call in the established doctor until the illness gets so desperate that a cure becomes difficult or even impossible. For this reason the medical science in rural communities is not held in high esteem. But in the cities considerable attention is paid to sanitation, and the hospitals of the capital are unsurpassed in all of Europe.

The spiritual welfare of the people is also looked after by the State, at least to the extent of paying the salaries of the priests. But the Roumanian, being deeply religious, calls upon the clergy for many extra services, such as weddings, christenings, and funerals, and for these he makes payment according to his inclinations, which are usually out of proportion to his means.

THE POSITION OF THE JEW

Nearly five and a half million of the King's subjects belong to the Orthodox Greek Church. This is such a preponderating majority that religious questions do not arise to complicate the political situation, beyond the ever-present position of the Jew in the economic life.

He has been declared "an alien not subject to an alien power," and in this manner has been cut off from the protesting voice of any friendly nation. Unwelcome in the villages and rural districts, they have been compelled to live in artificial Ghetti, thus created in the small rural townships, and in the larger towns, and legislative decrees have restricted their vocations and professions.

The Roumanians regard their relations to the Jews as a question of internal polity, and look with disfavor upon any discussion of the topic that is not purely academic.

The enjoyment of their many church festivals prompts the addition of fêtes of a purely worldly sort. It is doubtful if there is anywhere another people so fond of innocent amusements as the Roumanians. There is hardly a village of any size that does not have a dance on Sunday as well as every holiday, and all the country taverns have a piece of well-beaten ground or floor on which the people, young and old, may dance the *hora.*

This name, from *chorus,* has been handed down from the Romans, and, with varying qualifying words, applies to most of the popular dances. True to the etymology of the word, there is no limit to the number of the participants. To the music of the band, or by their own singing, they move with rhythmical steps, now to the right, now to the left, the arms swinging in cadence. Started by a few, others join in when and where they choose, until the circle grows so large that it may become necessary to break it into two or more concentric circles.

Besides the dances there are many sports and games that are popular throughout the kingdom, and in all of them general participation is possible. This community enjoyment has contributed no little to the neighborly impulses that show themselves on every hand, though it may be that it is due to general friendliness that games of this sort are popular.

AN ILLITERATE PEASANTRY

Although an act passed in 1864 endowed Roumania with free and compulsory elementary education, the services of the children were deemed so necessary for doing the work around the house that the schools were slimly attended, and the only impulse to patronize them was to make the growing generation immune from the cheating and deception that were practiced on the uneducated.

Then, too, the absence of any disrespect for illiterate parents prompted many to feel that education has but little efficacy in the social uplift, and so, if the boy does not wish to become a priest, the need of the school is not apparent.

Still, the frequent visits of the richer classes to the centers of learning and culture have stimulated a thirst for greater knowledge, and the universities and technical schools are extending their influence downward to meet the elementary schools in a general educational awakening.

These stimulating agencies have diminished the illiteracy by half in the last decade, increased the efficiency of the

Photo by E. M. Newman

A FINE BUILDING IN BUCHAREST

"The streets are wide, and the many boulevards, quite worthy of the name, even in the Parisian acceptance of the term, use up a large amount of space, but yield ample returns in the health and beauty they create. Along these streets we find attractive shops and pretty buildings, government offices and a royal palace, comfortable hotels and well-equipped hospitals" (see text, page 387).

ROUMANIAN DRIVER: BUCHAREST

"Around the waist he has a sash of a color to suit his great coat, with the two ends trailing over the seat ready for use as a signal cord by the patron unable, because of linguistic limitations, to otherwise give the order to stop, turn to the right or the left" (see text, page 387).

ROUMANIAN OFFICERS: BUCHAREST

"The roster of the standing army calls for 290,000 men, armed with Mannlicher rifles. . . . The army is the pride of Roumania, and its efficiency, demonstrated on more than one occasion, is a tribute to the organization, direction, and training of the late King" (see text, page 378).

primary schools, added to the scope and curricula of the fitting schools, and extended the usefulness of the technical colleges. The institution that has attracted universal sympathetic interest is the school for the blind, endowed and protected by the poet-queen, Elizabeth, better known by her pen name, Carmen Sylva.

From the depths of grief and the darkness of despair into which she had been plunged by the death of her only child, Carmen Sylva looked about to see if there were any as unfortunate as herself, with the intention, if such could be found, to devote her time toward alleviating their wretchedness. In her happy days she had seen so much beauty that she thought she could realize the deprivations of those who could not see, so she equipped her model school and found some respite from her loneliness in brightening the lives of those doomed to dwell in unending night. She spends much of her time in the school reading to the pupils and helping them to see the beauties of nature through her receptive eyes.

A PLEASING CAPITAL

No description of Roumania could be complete without some reference to her capital, Bucharest—Bucuresci, "the city of pleasure." Baedeker, if there were one, would tell you that it is a city of three hundred and forty thousand people, spread out over a rather monotonous plain, with a superficial area almost equaling that of Paris.

This great expanse per capita is due to the fact that the majority of the houses are one-storied, and buildings of more than two stories are very rare. Then, too, the streets are wide, and the many boulevards, quite worthy of the name even in the Parisian acceptance of the term, use up a large amount of space, but yield ample returns in the health and beauty they create. Along these streets we find attractive shops and pretty buildings, government offices and a royal palace, comfortable hotels and well-equipped hospitals.

The larger of the two universities is located here, and the capital is the center of art, scientific and literary activity. Its amusements, copied somewhat freely from those of Paris and Vienna, have the patronage that one expects in a southern city, and the spacious parks invite the seeker for quiet repose. In the meeting here of the West and the East, the motor-car is vanquishing the droshky and its picturesque driver.

A MUCH BEDECKED DRIVER

Nothing gives, for the money expended, such a feeling of wealth and aristocracy as a ride in one of these victorias, drawn by two fast-stepping coal-black horses and driven by a bearded coachman wearing a velveteen cap and an overcoat of the same material, which almost reaches his heels. Around his waist he has a sash of a color to suit his great coat, with the two ends trailing over the seat ready for use as a signal cord by the patron unable, because of linguistic limitations, to otherwise give the order to stop, turn to the right or the left.

The other cities of Roumania are deficient in interest and the monuments are rare and commonplace. Some of the river ports are centers of extensive trading in grain, but the business is so largely in the hands of foreigners that they retain but little that is peculiarly Roumanian.

In the Balkan war of 1912 Turkey's enemies were fearful that Roumania would go to her assistance and, in case of victory, profit by the acquisition of Bulgarian territory. On the other hand, the Turks knew that with Roumania against them their defeat would be prompt and complete.

Roumania held aloof.

When the Allies, dissatisfied with their shares of Turkey as distributed by the Ouchy Conference, fell upon one another, it was again a question as to what course Roumania would take. She, at an opportune moment, took the part of Servia and Greece and received in return for a small expenditure of men and money the province of Silistria.

Just now a greater conflict is raging, and the aid of Roumania is eagerly sought. Is she a pivotal State? If so, which way will she turn and what will be her reward?

A RICH ROUMANIAN PEASANT

ROUMANIAN PEASANTS

"The Roumanian is not a tradesman, and his main interest lies in farming. Even the selling of the surplus grain usually takes place at his farm to itinerant buyers, for he seems to be wary of the town merchant and rarely trusts himself to the wiles of the city, except on the occasion of the annual fair" (see text, page 373).

SERVIAN NATIONAL COSTUME

The Servian peasant woman is fond of bright colors and flower-covered costumes. Yet these costumes are worn with an ease of manner and a grace of bearing which makes one forget their quaintness.

Photo and copyright by H. C. White Co.

BULGARIAN GIRL IN THE NATIONAL COSTUME: SOFIA, BULGARIA

The atrocities committed against her Bulgarian subjects by Turkey in 1876 were so terrible and wide-spread that they shocked all Europe into considering ways and means to end them; but the results of their conferences were rejected by the Sultan, and Russia decided to fight the Turks single-handed for the liberation of her kinsmen. The Treaty of San Stefano and the articles of the Congress of Berlin followed, setting up Bulgaria as an autonomous principality, after Russia had reached the gates of Constantinople as a result of her eighteen months' campaign.

Bulgaria today is largely an agricultural country, and agriculture, still carried on after the primitive fashion of other centuries, for the most part, remains the principal source of wealth. Peasant proprietorship is almost universal, the average Bulgarian farm containing about eighteen acres. The farmers enjoy the right of pasturing their cattle on the commons and of cutting wood for fuel and home building in the State forests.

The government has made strenuous efforts in recent years to get the peasants interested in education and to introduce improved methods of agriculture and stock breeding. Service in the Bulgarian army is universal and compulsory. The peace strength of the army is about 60,000, of whom 3,900 are officers. The strength of the field army is about 280,000 in war times, and the total trained forces of the country approximate 450,000. The German system of military training has been in use for a number of years.

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THE NATIONAL GEOGRAPHIC MAGAZINE

THE BEAUTIES OF FRANCE

By Arthur Stanley Riggs

Author of "France From Sea to Sea," "Vistas in Sicily," etc.

TO MANY of us, France is the loveliest land in all Europe. So marvelously rich and beautiful is she that we all forget how far north she lies—between the forty-second and fifty-first parallels. It takes thinking to realize that Paris (latitude 48° 50′ 14″) is approximately opposite Quebec, and that Bordeaux, away to the south, where the government was established for a time during the earlier days of the war, is vis-à-vis with Halifax.

To interpret France geographically, yet in practical terms, turn to the map. (See map of Europe, 28 x 30 inches, in 4 colors, printed in the July, 1915, number of the National Geographic Magazine.)

Begin at the extreme southwestern edge of the country and draw a line from Bayonne northeastward to Troyes, near Paris. Then continue this line north and west a trifle, through Rheims and Valenciennes, and you have bisected France roughly into its dissimilar parts. The western section of low plateaux and flat and rolling plains contrasts sharply with the high plateaux and mountains of the east and south.

GEOGRAPHICAL STRENGTH OF FRANCE

In other words, Nature, during the long ages of anticipation and formation, prepared France against the day of her enemies by rearing mighty barriers along a large part of her landward boundaries, while at the same time she gave her free access to the sea. Nor was this all. The contour of the land was such that it provided huge natural arteries of communication between the Atlantic and the Mediterranean.

Partition France a little more closely, this time by rivers, and see how it falls into natural sections, with the four great river systems of the Rhône, Garonne, Loire, and Seine, and their innumerable canals and tributaries. The canals might be called the missing links of the river systems, for by their connecting means the Atlantic and the Mediterranean are directly linked in a vast aquatic and maritime chain.

This means that France possesses valuable facilities for transportation entirely distinct and separate from her marvelous network of railways and magnificent "flowing roads." In fact, it would be hard to imagine a country more fully protected on the one hand, more open on the other, and throughout blessed with more ample and satisfactory avenues of communication. As an example of the value of the waterways, consider them in time of war as transporters of supplies, when the railways are overworked with their handling of troops; or in time of peace as outlets for agricultural and

A GROUP OF NORMANDY WOMEN AND BOYS

Upon such as these fall the burdens of watching and waiting, hoping and despairing, during the awful days of war in which France fights as never nation fought before

manufactured products at a lower rate than the swifter railroad trains could possibly make.

FEW LAKES AND SEAPORTS

Curiously enough, France has neither many lakes nor any important ones. Lake Geneva, which for more than 30 miles forms a part of the French border, is Swiss. Really, the only large lake in all France is Grand-Lieu, just south of Nantes, in Brittany, and it measures only 17,300 acres in extent. Another curious geographical feature is that, the length of coast considered, France is inadequately supplied with true seaports or harbors capable of receiving and sheltering large vessels. But the river ports make good that deficiency to a considerable degree, and not only serve invaluably thereby, but add greatly to the picturesqueness of the country.

We do not usually associate railroads with anything except utility. But the mesh of steel that so comprehensively covers the land from end to end, and side to side, is often a very striking element of beauty. The shining metals bore through the mountains and skim across crooked gorges, parallel the great rivers and wind among the splendidly cultivated farms. Little toy locomotives, with shiny brass bodies, pulling local trains, have all the seeming of strays, as they amble at a snail's pace among the fields or rumble along the roads beside flocks of sheep, through dusty little towns half asleep and totally indifferent.

Some of the lines, especially in the south and southeast, have been built almost in defiance of Nature. Throughout several of the mountainous provinces the engineering difficulties have been enormous; but with tunnel and culvert, via-

THE FLOWER GIRLS OF NORTHERN FRANCE

What woes their country bears, what sorrows and sufferings their fathers and mothers know, may their childish lives not realize!

duct and bridge, the engineers have sewn the mountains together with their steel bodkins and made possible comfortable exploration for the least adventurous traveler.

REGIONAL ARCHITECTURE

The geography of France has affected the people as well as the climate and the architecture. Though the old provincial boundaries are gone long ago, the characteristics the people of those former divisions imbibed from the soil remain the same, and in each lives a pride of locality second to none, with idiosyncrasies of speech and custom and costume easily traced back to regional conditions and peculiarities. In architecture we find the explanation of some of the most remarkable buildings of the country in the geographical conditions of their locations.

In the great plain of Toulouse, for example, stone is not available, but there is plenty of good clay. Consequently, the Toulousans have wrought with brick, rearing churches and palaces of the noblest types by using the material at hand, and adapting their style to their means, instead of going far afield for stone or marble and building structures without a whit of local significance.

Photo from Dr. Hugh M. Smith

CHURCH OF THE MADELEINE: PARIS

This church, built in the style of a Roman temple, was begun in 1806, on the foundations of a church of the eighteenth century, by Napoleon Bonaparte, who intended it for a "temple of glory." The architect was Vignon, but the church was not finished until 1842, by Huvé. It measures 354 by 141 feet and is 98 feet high. It is surrounded by a majestic colonnade of forty-eight splendid Corinthian columns.

LIKE AN ENORMOUS HOTHOUSE

It might fairly be said that the general impression France, as a whole, leaves upon the beholder is—green. Perpetually moist of climate—except in the south—endowed with heavy and continuous rainfalls, and having a temperature which is astonishingly even, year in and out, the country is like an enormous hothouse. The result is a study in greens of every conceivable and inconceivable shade. Verdure and foliage range from greens that are gray or black to greens that are hardly more than yellow. From the hardy pastures high upon the sides of the towering Pelvoux range, thousands of feet above the sea, to the cactus and agaves and olives that grow at the water's edge, the verdant nuances are a revelation in rural coloring.

But France is not all green, either. That is only the background, the filler, as it were, for a warm-toned picture full of highlights, touched with the gold of grain, the ruddy tiles of ancient roofs, the fiery spatter of poppies, the tawny flood of a river or the steely thread of a brook; and on the glistening southern shore, with cliffs as red as any soil New Jersey boasts, water like melted sapphires, villas covered with majolica tiles that make the beholder rub his eyes and wonder if he is dreaming the amazing inebrieties of style and color that strive to but cannot shatter the harmony of creation.

INDIVIDUALITY OF THE PROVINCES

Just as the visitor to a picture gallery retains a much stronger impression of the merits of different painters by seeing the works of only one at a visit, so I believe the beauty and charm of France are best remembered by considering her provinces one at a time. Almost every one of the older divisions of the country has some feature distinctly its own that fixes it indelibly in mind (see map, page 471).

Brittany is always the "Land of Pardons," a bleak, wind-swept peninsula full of silent, undemonstrative folk who live by the harvest of the sea. Dauphiné, whose Alpine sierras saw the horizon with their snowy teeth, burns with glorious sunsets that fire its savage grandeur; Burgundy, of the wine; Champagne, of the "liquid sunshine"; Auvergne, of the dead volcanoes, like giant beehives, and Touraine, that was and still is the playground of France, are all characteristic and easily remembered.

Not less so is Normandy, with its shimmering streams and its wide-spread orchards of cider apples — acres and clouds of pink and white and green in the tender spring—the air quick with the thin, sweet, subtle fragrance. And spring is not only "apple-blossom time in Normandy." By every farm, about the railroad stations, along the roads, and in private estates bristly hedges of scented haws vie with the purple and the white clusters of great chestnuts, the long festoons of the towering acacias (locusts), and other flowers innumerable.

RURAL ENGLAND IN NORMANDY

Coming down from Cherbourg toward Paris many of the vistas are strongly suggestive of England — trim little farms, whose quaint old houses hide behind tree and hedge; moss-grown open byres, where sleek cattle chew their reflective cuds, and splendid, towering old trees, among the finest in France. And the roads—royal highways, smooth as floors, bordered by endless processions of trees, as carefully tended and trimmed as if they were in a park. Like gaunt sentinels, they point out the road and its direction as far as the eye can reach, and rival in their erect precision the troops for whom the roads were originally built.

What an air the many mud-houses have, with their great thatched roofs! The walls are built of a sticky, clayey soil, that dries rock-hard in the sun. The roofs are a joy, simply thick rolls of straw laid close by the farmer and cemented together by Nature in a few months with moss and flowers. They overhang the sunny wall and shelter the vines—sometimes they are trees, trained like vines—that border door and window, and the whole place radiates a spirit of solid prosperity and comfort, as well as beauty and charm. The beauties of Normandy are as varied as they are striking, and a single day among them brings a

Photo and copyright by Underwood & Underwood

HAULING A FISHING BOAT UP ON THE BEACH AT ETRETAT, FRANCE

The cliffs at Etretat are among the most interesting on the French coast. They are pierced by openings worn by the action of the sea. Etretat is a noted resort, especially affected by artists and literary men, who are attracted by its picturesque and curious situation. It is about fifteen miles north of Le Havre.

sympathetic understanding of the struggles of centuries to hold such a lovely province.

One of the fiercest of these struggles began with the Norsemen away back in the ninth century. Their strange, dragon-prowed galleys swooped down upon the French coasts, and the frolicsome vikings came inland, killing, burning, and destroying in true pirate fashion. It took them about a century to secure more than a mere toehold; but then King Charles the Simple did a wise thing and made the pirates welcome. They settled thickly along the lower reaches of the Seine and made Rouen their capital. And the Norsemen were no mere freebooters. Under Rollo the Ganger they fathered the Normans, who conquered England in 1066, and gave their name to this rich and desirable region.

THE FAMED TAPESTRY OF BAYEUX

The story of their conquest of England reposes safely under glass today, after a somewhat stormy career, in the placid

Photo by Emil P. Albrecht

A FINE OLD TIMBER AND STONE STRUCTURE OF THE FIFTEENTH CENTURY: ST. LO, NORMANDY

In olden times a hospital, but now devoted to trade. The upper stories project one over the other; the beams are all admirably carved

little city of Bayeux, one of William the Conqueror's towns. Bayeux's quaint old houses cling about the handsome cathedral as barnacles grow upon a rock, and through the meadows all about meanders a sleepy little stream gemmed with lilies.

But it is the "tapestry" in the museum that makes Bayeux a magnet. No more original or curious history of a war was ever wrought than this seamless strip of plain linen—not tapestry at all—230 feet long by 20 inches wide, covered with vivid sketches in worsted embroidery of eight colors. Clearly and in great detail the 58 scenes tell the story of the preparation of William the Conqueror's fleet and the Battle of Hastings. The needle sketches are rude and simple, hardly more than mere artistic shorthand suggestions; but they were done with such

fidelity to the facts and such dash that they move us even yet as no mere written account can.

WILLIAM THE CONQUEROR'S FAVORITE TOWN

Duke William's favorite town was Caen, where he and his Duchess, Matilda, who defied the canon law by marrying within the forbidden degrees of consanguinity, did royal penance by building two great abbeys, whose churches of St. Étienne (St. Stephen) and La Trinité contribute so greatly to Caen's beauty today. William's church of St. Étienne, stark and bold and lofty, most wonderfully represents his indomitable spirit and ideas.

The smaller, richer, and more delicate Trinité is no less characteristically feminine a monument to Duchess Matilda.

Another memorial, an insignificant single stone in a pretty, forgotten, flower-starred byway of the old Protestant cemetery, marks the spot where Beau Brummel, the man who for all time made "exquisite propriety" in dress the standard, lies in oblivion beneath the waving grasses of this Norman hillside.

Caen boasts many splendid palaces of the merchant princes who flourished so magnificently during the Renaissance, and just below the old castle their antitheses in a twisty labyrinth of wandering streets full of quaint old lesser houses. Right in the heart of the town, where the two busiest streets cross, the flower market splashes a great dab of brilliant color on the gray old stones—flowers in pots, in frames, in huge untied bunches cover the sidewalk and the curb in the grateful shadow of the trees.

Below the town idles the lovely little Orne, a sleepy stream, at sunset a dream-river, running noiselessly by broad, grassy, tree-hedged promenades and lush meadows, where gray and brown nets overhang the walls and the multi-colored rowboats glow like strange jewels upon the river's placid breast. Queer little rickety bridges bar its shining length as it slips northward out of the city, and away through the lovely Norman country of great, rolling fields, golden with grain and dotted with farm-houses and apple orchards, toward the gleaming white sand-dunes that fringe the bay of the Seine with iridescence.

Big and little steamers ply slowly up and down the canalized waters of the Orne, and make one think of the Suez Canal. You can almost shake hands from deck to deck as the vessels pass between the endless lines of serried poplars. The Normans themselves, blond and tall and handsome, contribute in no small degree to the beauty of the scene with their decidedly English coloring and appearance.

THE SEINE FROM LE HAVRE TO ROUEN

Across the bay from the mouth of the Orne are the mouth of the Seine and the great ship-building and commercial port of Le Havre. The glorious river that leads from Havre to Rouen and on to Paris is a stream of delights, winding tortuously among little towns, farms, the ghostly ruins of former grandeur like Jumièges, and between chalky cliffs now and again, that rise hundreds of feet above the river, or, low and beetling, shelter astonishing cave communities, whose homes are bored right into the solid rock.

Splendid wooded peninsulas jut out into the stream, that widens below Rouen into as majestic a flood as the Hudson; and then the ancient pirate stronghold itself comes into view, shrouded with the smoke of its factories and busy with the activities which have taken the place of the industries of a thousand years ago.

How can we describe this city of the pirates; how give a picture of the long quays beside the river, shining in the brilliant sunshine after a summer's rain; the broad thoroughfares plowed right through the old town and lined with dull modern houses; the occasional bits of the Middle Ages that still linger here and there in some old street whose houses peep and mutter at one another across the way? Such is the dark, crooked, villainously paved Rue de St. Romain, beside the cathedral, one of whose houses, the Rouennais, is called the "House of the Bishops" because, forsooth, its corbels are decorated with bishops' heads.

On the other side of the street drowses its neighbor, the "House of Joan of Arc."

THE CHURCH OF ST. OUEN: ROUEN, FRANCE

"First in importance is the Church of St. Ouen, crested with that elegant central tower called the Crown of Normandy, gleaming with so many lofty stained-glass windows that it seems all one great jewel, and always ready, if you gaze into the holy-water font, to give you a glorious reflection of practically its entire interior—vaults, pillars, arches, and splendid windows" (see text, page 401).

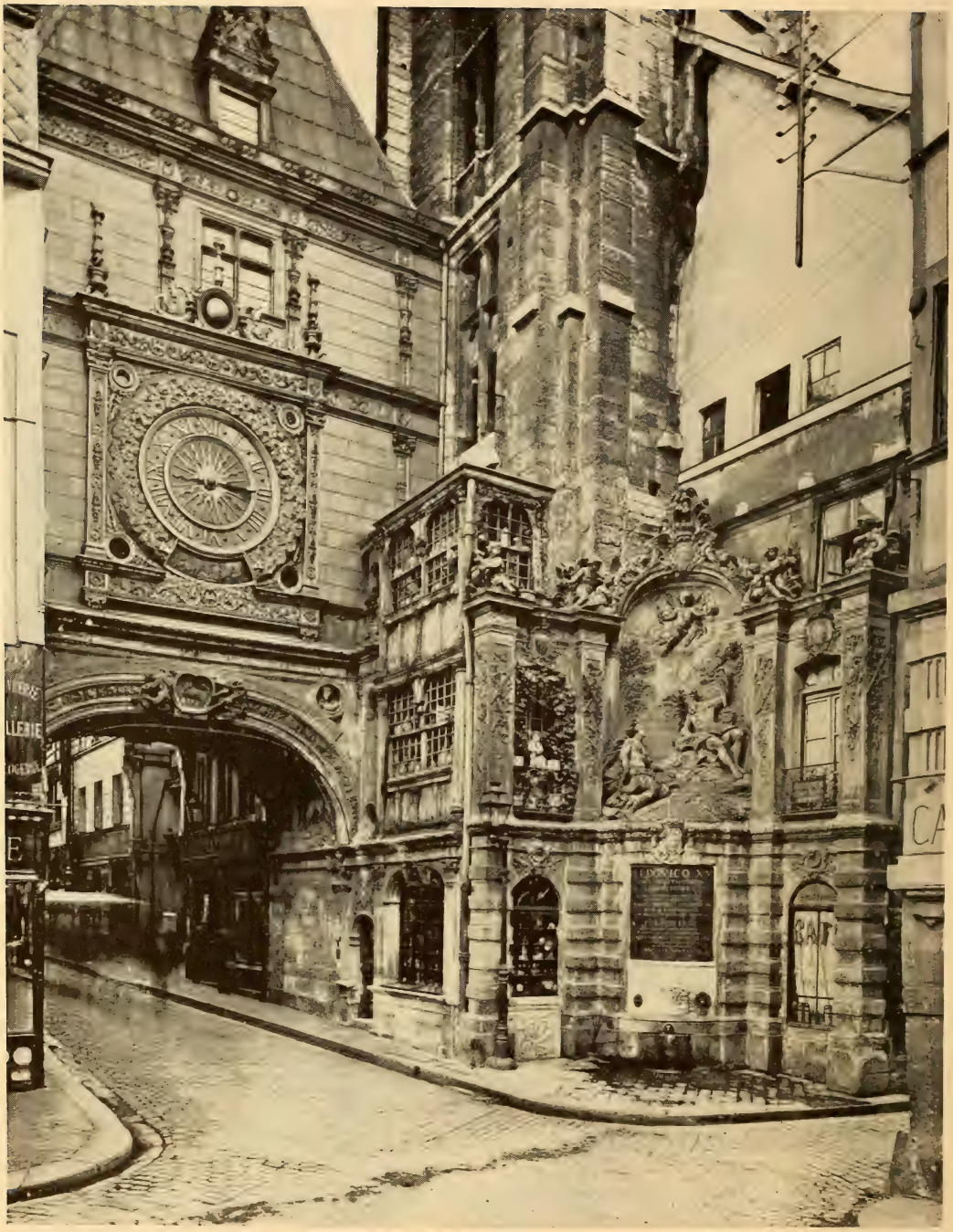


Photo by Arthur Stanley Riggs

IN THE CITY OF ROUEN, NORMANDY

The Street of the Great Clock, which dates from the sixteenth century. At the right, with Louis XV's fountain in its base, is the lofty bell tower, whence the silvery-throated Rouvel called the Rouennais together on many a memorable occasion (see page 402).

Did Joan ever see it, we wonder? And then there is the great sixteenth century Maison de Bourgthéroulde, with its exquisitely sculptured façade, the windows exceptionally effective and beautiful. On one wing are the famous historical panels picturing the celebrated meeting of Kings Henry VIII of England and Francis I of France on the Field of the Cloth of Gold. These are mere suggestions; Rouen is full of others no less interesting. Just off the broad, modern Rue Jeanne d'Arc a careful citizenry has gummed the Renaissance façade of an artisan's house to the stone wall of a big business building, that men may see how their fellow-workmen of four centuries ago lived, when "a man was proud not only of the house of his God, but of the house wherein he dwelt."

The city's great appeal, of course, is as a show place of magnificent ecclesiastical architecture. Certainly no one could think of the beauties of France without instantly visioning the country's astonishing array of these sacred edifices. They have to a very marked degree the characteristics of their locations, and are therefore in the same physical category as parts of France, as the mountains and plains, the rivers and trees, taken province by province. Geography has influenced them; foreign trade has had a part in their design; and, most of all, in the great Gothic cathedrals we find that Nature herself has been the model from which the inspiration that crystallized in them has been drawn.

CHURCHES OF ROUEN

The Cathedral of Rouen towers above the busy town as a memorial of creation. From its Tour de St. Romain, on the north side of the façade, to the opposite Tour de Beurre—built largely with the money received for dispensations permitting the faithful to eat butter during Lent—the structure presents an architectural progression which typifies all the styles in vogue during the 400 years it was in process of construction. If you do not like this effect, you can always find a beautiful portal or window or capital at hand to admire; and right under the aged walls is the little flower market, where a glorious burst of kaleidoscopic hues wonderfully livens up the cold stones and gives a flashing contrast to the somber and curious Street of the Grocers, which opens out of the square.

After the cathedral, first in importance is the Church of St. Ouen, crested with that elegant central tower called the Crown of Normandy, gleaming with so many lofty stained-glass windows that it seems all one great jewel, and always ready, if you gaze into the holy-water font, to give you a glorious reflection of practically its entire interior—vaults, pillars, arches, and splendid windows. The smaller Church of St. Maclou is a veritable gem of the florid Gothic. Its builders had a new ideal and piled up a wonderfully captivating façade, curved outward, with five richly sculptured arches, growing in size and rising in height toward the center (see page 399).

Of the innumerable churches in Rouen, almost every one is to be visited for some personal peculiarity or beauty or for its historic associations. On the apse of St. Vincent a little salt porter recalls the right King Charles VI gave to the church in 1409 to take toll from every bag of salt that entered the city. Other churches are today but desecrated skeletons. Here one is inches deep in the sticky lees of cheap red wine, with its profaned altar dripping as red as any sacrificial stone the Druids ever knew; yonder one still caring for man, but as an inn for the body instead of for the soul. And from the tower of one, whose nave echoes now to the dish-pan feet of splendid Percherons, the lonely figure of King David looks out over the transformed city and fingers his harp in silent regret.

WHERE JOAN OF ARC WAS TRIED

In a city whose history is so complex as that of Rouen, so full of the most astonishing violence, the centuries have naturally woven a spell of both beauty and romance about the ancient clock-tower and bridge grouped under the name of the Grosse Horloge. The bell-tower is something to look for in every French city as the symbol of popular sentiment. Quite as often as not the bell roused the people against their rulers; again it called them from behind their

Photo and copyright by Underwood & Underwood

VINEYARDS COVERING SUNNY FIELDS IN THE CHAMPAGNE DISTRICT: FRANCE

counters and out of their beds to fight one another or a common enemy.

Their bells came to have souls to them as well as names, and French history is full of the picturesque parts they have played in those stormy times. The Rouen tower is ungainly beautiful, and its silvery bell, ancient Rouvel, one of the most famous in France. Below, in the center of the bridge that spans the busy street and resembles the Bridge of Sighs not a little, the Grosse Horloge, or Great Clock, still tells the time and a good deal more. But the most pleasing thing about the bridge is the arms of Rouen, a lamb bearing a cross over its shoulder, with one patté raised. What an emblem for a city of wool merchants whose enterprises were always on the go! (see page 400).

Interest of the same human sort centers in the stately flamboyant Gothic Palace of Justice, a building that has the majesty of a range of mountains and the beauty of genius in sculptured façades,

Photo and copyright by Underwood & Underwood

THE BIRTHPLACE OF THE MAID OF ORLEANS: DOMREMY, FRANCE

More than five hundred years ago Joan of Arc was born in this old house. Though considerably remodeled, it is essentially the same home in which her childhood and early youth were spent. The statue in the foreground was placed there in honor of her memory. History tells how this country girl, fired by heavenly visions of patriotic duty, inspired the Prince to royal courage, led the army into battle, drove out the English, secured the rightful sovereign's coronation at Rheims, and then—alas! for the weakened ingratitude of man—was given over by her own countrymen to the English, who burned her at the stake for a witch, at Rouen.

Photo and copyright by Underwood & Underwood

LATE AFTERNOON ON A BEAUTIFUL ROAD NOT FAR FROM PARIS

"And the roads—royal highways, smooth as floors, bordered by endless processions of trees, as carefully tended and trimmed as if they were in a park. Like gaunt sentinels, they point out the road and its direction as far as the eye can reach, and rival in their erect precision the troops for whom the roads were originally built."

symmetrical turrets, and cassetted ceilings.

But deeper than all these lies our interest in the lonely tower of the city's former defenses, where Joan of Arc was tried for her life—and lost. The great, cone-topped cylinder is rugged and stalwart, a perfect—restored—picture of a defensive tower of medieval times, with its wooden hoardings and machicolations. Nearby slabs, in the pavement and upon the wall of the Old Market, mark the spot where the heroic maid paid for her patriotism by passing through the fire. And upon the hill of Bon Sécours, beyond the city, a huge memorial to her crowns the height and looks down upon the silver-bosomed Seine.

BETWEEN ROUEN AND PARIS ON THE SEINE

In great arcs the river sweeps away to right and left past rich bottom-lands, checkered with cool, tender greens and warm russet browns. A whole archipelago of lovely little islands, seven of them, flecks the burnished mirror of the stream. Bushily they raise their green heads of balsamy pines and lacy poplars against the sky in delicate silhouettes,

A VIEW OF EIFFEL TOWER

When the first telegraphic message sped over the wire between Baltimore and Washington, the world exclaimed in the words of that message, "What has God wrought!" And yet as we contrast that feat with the recent one, in which the human voice carried from the tower of Arlington, Virginia, to the tower of Eiffel, and from Arlington to Honolulu, it seems almost as an every-day occurrence contrasted with a miracle.

Photo by Donald McLeish

FRENCH CHASSEURS DES ALPINS, DEFENDERS OF THE MOUNTAIN FRONTIERS OF FRANCE

No hardier soldiers are to be found anywhere than these mountaineers of the French Alps. Every one an expert mountain climber, every one accustomed to the perils of the avalanche and the precipice, they are men who know no fear and for whom death has no terrors.

and the long tows of river barges glide slowly past them like so many swollen sea-serpents.

But perhaps the loveliest spot in all the winding miles of beauty along the river between Rouen and Paris is Petit Andely. Ragged and shattered-looking, the stony hill rears proudly up above placid river and sleepy town, and squarely upon its crest looms the ruin of Richard the Lion Heart's Castle Gallant—a great, bursted keep and a few bits of massive wall. Once the castle flaunted its menacing leopard standards against the blue and white and gold of the Frankish skies; but that was before Philippe-Auguste stormed and smashed it, and smashed the townsfolk while he was doing it.

Now, ghostly and wan, the stark ruin shimmers upon its hill, with never a single spear to glint from keep or barbican. The spears are still growing far below—the stout young poplars on river bank and island sentineling through golden days when the river is gleaming jade; in the fiery sunsets, when it mirrors back every sturdy limb and feathery frond, and all the silent blue nights, when the stars bend crackling down to whisper and coquette and the ripples chuckle softly against the rich brown banks.

Nature was in no gentle mood when she retched up along the Breton coasts great blocks of granite. Greatest of them all, Mont St. Michel towers above the flat country side and the treacherous quicksands of the shallow bay, whose inrushing tides come white-lipped and ruthless to foam at its feet, raging but impotent.

THE FORTRESS-ABBEY OF ST. MICHEL

In those creative days that we call the Middle Ages, man could not see such a magnificent site go unoccupied—and lo! the upper half of the rock came to life in one of the most wondrous and inspiring religious edifices the world has ever seen, the beautiful, militant fortress-abbey of St. Michel, thrusting its slender spire skyward in an effort to pierce to heaven itself. No written word can image the daring, the grace, the consummate artistry of the massive pile, at once a part of the rock and yet perfectly apart from it—a work of man that has all the majesty of the work of Nature herself.

Beneath the great, spreading wings of the abbey nestle the narrow, high-walled, tenement-like houses—so many chicks about their mother; and hidden away among the rocky terraces, here in an angle of the abbey walls, there behind houses or hotels, the most amazing little gardens gladden eye and heart. They burn with multicolored flowers and they fruit in season. Their cherries and figs are famous and their shade trees give grateful shelter; but it is the beauty of the gardens most of all and the strangeness of finding them here, springing from the barren rock, that makes them quite as wonderful and inspiring as the towering abbey itself (see page 452).

Another great rock at the water's edge—but this time low and flat—bears up the old walled city of St. Malo, quaint, unspeakably dirty, and picturesqueness itself. Clear to the third story of the houses rise the walls, from which the slippery streets appear as dim, wet, haunted canyons, unusually curious, especially when at the end the huge and ornate spires of the cathedral dwarf everything else with their imperious bearing. But somehow St. Malo never seems Breton, perhaps, because so many English vacationists make it their rendezvous.

BRITTANY, THE PURITAN PROVINCE

The real Brittany is an open, wind-threshed, compelling country of gray and green, a hardy province able to withstand the buffeting of the sea and its gales, inhabited by a race who fear only God and the sea, but man not at all. They live in and by the sea—and the sea by them. Their clouds of blue nets hang high in the sun from gleaming brown mast and yard in the harbor of Douarnénez, the symbol of their victories. And in the nave of many a little country church throughout Brittany the Sea has her symbol—a waiting catafalque.

The Breton takes his religion with the seriousness of a Puritan. All over France crosses rise by the waysides, where the peasant may pour out his simple soul in prayer and forget for one refreshing mo-

Photo by Emil P. Albrecht

ST. ETIENNE-DU-MONT: PARIS

"And as for Paris, who does not know her beauties?—the beautiful quays by the smooth-flowing river, the magnificent bridges, the majestic tree-lined boulevards, the arcaded streets, the narrow, twisty, black little alleys; the illustrious buildings of every age, the stately triumphal arches, the incomparable parks; and on the Ile de Cité, the gem and heart of all France, the towering sublimity of Notre Dame."

Photo by Emil P. Albrecht

A FRENCH VALHALLA: THE PANTHÉON, PARIS

Standing over the tomb of St. Genevieve, the patron saint of Paris, the Panthéon is one of the noble buildings of a noble city. First a church, it was transformed into a temple of fame for the burial of the nation's great men in 1791, when Mirabeau's body was borne there, followed during the same year by that of Voltaire. After fifteen years it was transformed into a church again, remaining such until 1830, when it became a temple of fame once more, with the words, "To great men by a grateful country," inscribed upon its pediment. Once more it was transformed into a church in 1851, remaining a place of worship until 1885, when it was secularized again for the obsequies of Victor Hugo.

Photo by Arthur Stanley Riggs

A MISSING LINK OF THE FRENCH RIVER SYSTEM

The canals of France might be called the missing links between the great river systems. They afford exceptional facilities for transportation of slow and heavy freights from the Mediterranean to the Atlantic, besides giving their own peculiarly placed touch of beauty to many a lovely landscape, north and south.

KNITTING FOR FATHER AND BROTHER IN THE TRENCHES: NORTHERN FRANCE

ment the burden and heat of the day; and in Dauphiné there are miniature crosses, even in the fields, for the birds; but in Brittany the cross is often a great Calvary, with the figure of the Christ crucified between the thieves. Sometimes, as at Pleyben, it surmounts a structure like a Roman triumphal arch.

At Plougastel the most wonderful specimen of all has a great pedestal covered with curiously rustic figures which speak the patois of the people and portray the story of the Passion on the sloping ground of Golgotha, while below them the beautiful high-relief frieze supplements the more striking details with its quieter scenes. By cross-road and in churchyard these weird monuments give a bizarre touch that is unforgettable. These calvaries are no mere matter of architecture, either; they stand for the people. The churches themselves throughout the province are relatively simple and austere. It is the human side of Brittany, the quaint, artless, undemonstrative people and their customs and costumes that claim attention most of all.

QUAINT PENITENTIAL SERVICES

The pardons, those penitential services to which the people come to be purged of sin, are amazing demonstrations of faith and superstition—and wonderful costumes. Every town or region has its own variation of costume and colors, and a pardon crowd is as brilliant and full of contrast as a cloud of butterflies. Some of the women's costumes — heirlooms, every one — are exceedingly rich and costly.

Those of Pont l'Abbé and Quimper are of fine black broadcloth, banded heavily with black velvet. The tight bodice is ablaze in front with thick, heavy, brilliant embroidery — all done by old men — in vivid crimsons, gold, orange, salmon, blues, and greens. Over the full skirt is

Photo and copyright by Underwood & Underwood

ACRES OF OYSTER-BEDS AT CANCALE, FRANCE

Cancale is a town of 7,000 inhabitants, set up above the waves, but living by the sea. Its leading industry is oyster farming, and those of Cancale enjoy a wide reputation throughout France for their delicious flavor. The oyster-beds cover a total area of 430 acres and are an example of what the intensive cultivation of the bivalve can produce.

a fine silken apron of delicate lavender, green, pink, or cream, exquisitely embroidered. But it is the *bigouden,* or head-dress, that is most remarkable—a tight brown straw casque over the forehead and crown, broad black velvet earmuffs and bands, and a touch of filmy white.

Even the littlest children are in costume on pardon days, and the tinier they are the droller they look, though not so droll as papá, with his baggy gray or blue trousers, short jacket, embroidered clerical-style vest, and shovel beaver, with two long black velvet ribbons dangling down his back. There are other costumes in Brittany which are prettier, but none so characteristic.

Photo and copyright by Underwood & Underwood

FAMOUS AISLES OF STONE MADE BY PREHISTORIC MEN: CARNAC, FRANCE

"In even rows, the stones—from 4 to 16 feet in height—stretch across the desolate gray moor literally by the thousand. What story do they tell? Was this the burial ground of a nation? Do these unresponsive monuments hide the untold tale of a terrible field of blood and the wiping out of an army of thousands?" (see text, page 419).

THE MARRIAGE MART AT PONT L'ABBÉ

Pont l'Abbé has an amusing side-show to its pardon in the marriage mart that draws its own interested crowd. Any young woman who wishes a husband poses against the churchyard fence with her similarly wistful sisters, and love-lorn swains march up and down the line, inspecting with the sheepish gravity the occasion requires. Once suited, however, the Breton views his new property as a little less valuable than one of his great "beefs," or steers.

The weddings themselves are vastly more human and interesting than our own, and in them all the childlike gaiety of a simple and unaffected people comes out spontaneously. The dual ceremony—in church and town hall—once over, the newlyweds and their attendant friends

THE DOLMEN, KNOWN AS THE MERCHANTS' TABLE: LOCMARIAQUER, BRITTANY

Photo by Arthur Stanley Riggs

For generations men looked upon these striking structures as of Druid origin. More recent researches have led archæologists to conclude that they were burial vaults of the Megalithic period

THE INTERIOR OF THE MERCHANTS' TABLE (SHOWN ON THE PRECEDING PAGE): LOCHMARIAQUER, BRITTANY

"France possesses many menhirs (long stones) and dolmens (stone tables), and the very finest are in this locality. One, the Men-er-Hroeck, or Stone of the Fairies, the largest in the world, was nearly 70 feet in height and weighed about 342 tons. It was overthrown by the elements, and there is something very sad about this huge stone monolith, now shattered and prostrate upon the ground" (see text, page 419).

SWEET HOUR OF PRAYER: NORTHERN FRANCE

The country that closed its churches during the French Revolution has never been entirely without a rural folk with as pure a faith as the world affords

march out into the street by couples, and often enjoy a dance in front of the cathedral or church where the religious ceremony has taken place; and the music is furnished, of all things, by the bagpipes. The Breton has a more euphonious name for that instrument of torture. He calls it the *binious,* but it sounds quite as villainous when it skirls as any Scot pipe ever can.

After the dance in the street, when there is one, the procession forms again, led by the pipers, and goes merrily off to the home of the bride for a wedding feast; but, before they enter, the guests shake up a very satisfactory appetite in a dance curiously like the Catalan Sardanas as it is still seen in Barcelona, Spain.

A BRETON WEDDING DANCE

With the pipers, smock-frocked and beribboned, standing in the rear, the wedding guests join hands, with the bride and groom in a huge circle, and begin to sway about in an interesting sort of adults' ring-around-a-rosy. The steps are very complicated, each dancer not only moving about the periphery of the circle, but also executing a solo dance of an exceedingly lively cadence as he does so. The effect is very pleasing. Investigation developed the fact that the dance is believed to have had a Druid origin as a ceremonial thanksgiving, which, in the course of centuries, came to be used as an hymeneal dance only.

Another occasion for their gathering, the cattle market, is no butterfly affair, and though the men wear rusty old shovel hats with twin tails, the clothing of both men and women is of coarse, heavy cloth, and the women wear plain white caps. My observation is that the cattle fairs are more social than commercial. They are

ALL FRANCE BATTLES THAT THE NATION MAY BE FREE

Never was there a more wonderful example of a nation at war than the France of 1915 affords. Even great-grandmothers are not so old as to fail to contribute their share to the mobilization of all the forces of the nation for the support of the firing line.

often held in a "Scotch mist," that takes the heart out of everybody but the inhabitants, who are used to it, and turns the roads and the fair grounds into gluey yellowish-gray sloughs. The buyers and sellers sit around on the fences, or on old jute bags on the wet ground in the shelter of a wall, or stand out in the mud, cheerfully gossiping, and now and then talking cow or pig. Little pigs are for sale in the markets by the firkins-full. The canny housewife makes her selection, tucks the uproarious little fellow tightly under an arm, and goes contentedly off with the squealing pig.

WHERE PIG, FOWL, AND FAMILY DWELL TOGETHER

The Breton is not noted for his domestic cleanliness. In plain words, many of the peasant houses are so filthy one hesitates to set foot in them. Floored with dirt and roofed with straw, often they consist of one room only, where the sturdy family cooks, eats, and sleeps, along with whatever small animals they happen to have. The fowls are very friendly neighbors, who run in and out continually. The pigsty is frequently under the same roof as the family.

The huge fireplace, big and roomy enough to roast a whole sheep easily, is full of cranes and hooks and spits. Down one side of the room range the beds, which, more than anything else, look like closets, mounted upon deep chests which contain the precious costumes for fête and pardon. The Breton clambers into the open mouth of the closet over one mountainous feather mattress, covers

A VILLAGE SCENE IN BRITTANY

"The real Brittany is an open, wind-threshed, compelling country of gray and green, a hardy province able to withstand the buffeting of the sea and its gales, inhabited by a race who fear only God and the sea, but man not at all. They live in and by the sea—and the sea by them" (see text, page 407).

himself with another, pulls the sliding wooden doors or the very substantial curtains to, after him, and proceeds to prove false every hygienic theory of the scientists. Some of these beds are most elaborately carved and decorated. When, in a curio shop in Quimper, I asked what any American would want with such a dubious *objet d'art,* the Breton woman in charge replied that these beds made excellent bookcases for American houses when a carpenter has put a few shelves in them (see page 423).

The towns have their share of curious old houses—some carved, some curiosities in an architectural way, and some with unusual personal features, like the top-heavy, tipsy-looking "House of Gilles and his Wife," at a busy corner in Vannes. Fat and stubby effigies of the good burgher and his spouse lean out smilingly from the corner of the second story above the unquiet street and watch the throngs of passers-by with good-humored interest.

It must not be judged that Brittany has no castles, and that its rare charms are wholly simple. Such a magnificent château as Josselin, with its great, fortress-like turrets rising from the water, its beautiful inner court, and its vine-covered ancient walls, is a splendid example of the grand home as the antipode of the simpler one. Sucinio, ruined and desolate now, is another reminder of baronial splendor and an historic spot as well.

PREHISTORIC BRETON MEMORIALS

In southern Brittany, especially at Locmariaquer and Carnac, in the Morbihan, we can go back into prehistoric times and find human egotism and the love of praise and memorials just as keen among primi-

BEAUTIES OF BRITTANY

tive men as they are today among the most civilized. France possesses many menhirs (long stones) and dolmens (stone tables), and the very finest are in this locality. The standing columns, or menhirs, are in the nature of simple monuments. One, the Men-er-Hroeck, or Stone of the Fairies, the largest in the world, at Locmariaquer, was nearly 70 feet in height and weighed about 342 tons. It was overthrown by the elements, and there is something very sad about this huge stone monolith, now shattered and prostrate upon the ground of what was once a hallowed spot (pp. 413-415).

Carnac is perhaps the most remarkable place in the world for these prehistoric monuments. In even rows, the stones—from 4 to 16 feet in height — stretch across the desolate gray moor literally by the thousand. What story do they tell? Was this the burial ground of a nation? Do these unresponsive monuments hide the untold tale of a terrible field of blood and the wiping out of an army of thousands?

The dolmens are simply long, rough slabs of stone, supported by a row of vertically placed slabs at each side and the rear. Under this huge table a pas-

Photo by Arthur Stanley Riggs

LITTLE GIRLS OF PONT L'ABBÉ: BRITTANY

"Even the littlest children are in costume on pardon days, and the tinier they are the droller they look." The beautiful Bigouden costumes are gradually giving way to the meaningless modern dress (see text, page 412).

sageway and a vault have been excavated, and the researches of the archæologists have proved conclusively that these curious structures were neither Druid altars nor religious in their significance at all, as at first thought, but merely family or tribal burial vaults. Here and there, on the inner side of the end stone, one finds a wonderful inscription in wavy characters like snake trails—a language of the past, clear and distinct, yet unreadable—a puzzle as deep as the mystic inscriptions of Mexico and Central America.

SUNNY-TEMPERED ANGERS

Although Angers, the great city of the ancient province of Anjou, used to be called Black Angers, there is today no brighter, more attractive town north of the Loire. It is a city that has not only fine modern boulevards and buildings replacing its ancient walls, but a perfect wealth of architectural relics that keep its historic past always in mind—churches, half-obscured arches and reliefs, towers, and especially beautiful old houses, whose mere visages whisper of romance. And the women of Angers, even when they take the places of dogs in hauling carts about the streets, are sunny-tempered and pleasant-faced, as though hard work neither sours nor wearies them (p. 435).

Through the city runs the muddy, sprawling serpent of the River Maine, and dominating it bulks the low mass of the thirteenth century castle, one of the most impressive and imposing strongholds in France, notwithstanding most of its 17 towers have been beheaded and made level with the tremendous walls. The beauty of the castle today is that of age. Its stones are gray and hoary, and

Photo by Arthur Stanley Riggs

A MARKET SCENE AT VANNES, BRITTANY

"These towns have their share of curious old houses, some carved, some curiosities in an architectural way, and some with unusual personal features, like the top-heavy, tipsy-looking 'House of Gilles and his Wife,' at a busy corner in Vannes. Fat and stubby effigies of the good burgher and his spouse lean out smilingly from the corner of the second story above the unquiet street and watch the throngs of passers-by with good-humored interest" (see text, page 418).

the drawbridge's thin line of communication is suggestive in the extreme of the slender means of communication between the classes and the masses of those unforgettable centuries (see page 436).

On one side the moat has been filled up to provide for a handsome modern boulevard, graced with trees and fine buildings, while at an angle of the pentagonal castle, in a large open square, stands a monument of Count René of Anjou, the most remarkable man his times produced. The beautiful bronze figure represents the unfortunate monarch in tilting armor. In the niches of the granite pedestal on all four sides are exquisite little figures, also in bronze, of several of the Fulks of Anjou, of René's two consorts, and of his daughter, the heroic Margaret of Anjou, with her little son, Prince Edward of England. The monument is the work of David d'Angers, of whom his fellow-townsmen are justly proud.

A COMELY PROVINCE

Poitou is a comely province, of soft and delicate coloring, tender azure skies, unhurried streams "that moving, seem asleep." The whole rich and fertile region is a tone-harmony, full of subtle shades of color. Among the furrows great oxen toil with bent heads and patient eyes—the "beefs" the peasant often values more than his easily replaced wife. They plow; they reap; they haul heavy burdens along the endless white roads. They even brighten up the unutterable dinginess of railway yards, as they pad softly back and forth, shunting freight cars.

Through the sweet-smelling grain fields

Photo by Arthur Stanley Riggs

A MEMORIAL OF REPENTANCE: CAEN, NORMANDY

The façade and spires of William the Conqueror's Abbey Church of St. Étienne (St. Stephen), built as his penance for breaking the canon law by marrying his cousin Matilda (see text, page 398).

Photo by Arthur Stanley Riggs

A TYPICAL PEASANT'S BED IN BRITTANY

It is a sort of closet mounted upon a linen locker. The occupant climbs upon the mountainous feather mattresses, pulls the curtains or sliding doors tight shut, and goes to—suffocation. This bed was in a fisherman's house on the coast not far from St. Malo (see page 417).

Photo by Arthur Stanley Riggs

INHOSPITABLE CLIFFS OF IRON ON THE SHORE OF BRITTANY

The coast of Brittany is very much indented, especially where it fronts upon the English Channel, and it is also very rocky and reef-bordered

Photo by Arthur Stanley Riggs

A SEA OF SAILS: DOUARNENEZ, BRITTANY

The fisherfolk of Brittany are a hardy, sturdy race, and while they have never brought the steam trawler into service to the extent that Great Britain has, their catch is still an important food resource for France

Photo by Arthur Stanley Riggs

SEEKING ABSOLUTION AT PONT L'ABBÉ: BRITTANY

The simple faith of the peasant folk, who gather at the pardons of Brittany, is impressive and touching to all who behold these ceremonies. Their very faces proclaim the pure and unsullied lives they lead and the humble contrition they feel for what they conceive to be their sins.

little brass-bellied engines snort importantly, as they tow clattering trains of toy cars behind in their wanderings. The sleepy railway stations glimmer a dull red or tan in the golden sun, and soft-eyed, black-haired country folk watch with unfailing interest as the trains roll in and out. Poitou is very easy of access from Paris by rail—yet who knows Poitou?

It is full of lovely little towns; here one clustering about the skirts of a moldering château upon a hill; there one compacted closely by the demands of modern commerce about railway station or factory. And there is St. Savin, straggling leisurely along the banks of the cold, dark, swift little river Gartemps, which is full of trout. As many houses as can have crowded down to the walled bank, and the tall, precise poplars whisper over their dull red roofs as the stream flows by, its shining breast gay with vast garlands of a slender weed spangled with myriads of tiny, white blossoms.

Photo by Arthur Stanley Riggs

PAPA AND LITTLE YVONNE AT THE PARDON

The lofty trees and the ancient monastery, now turned into a *gendarmerie;* the old mill, with its low dam; and the squat, massive bridges give St. Savin character and to spare. But the town's distinction is apart from its beauty—its towering old monastic church, whose soaring vault is illuminated yet with exceedingly curious and dramatic twelfth century paintings, among the rarest of their kind.

ONLY ONE LEVEL SPOT

Poitou's principal city and capital, Poitiers, has a most remarkable location upon a pear-shaped hill, moated about naturally by the little rivers Clain and Boivre, which have made it almost an island. It is so compact, so jammed together, that the only level spot in town is the main square, upon the very crest of the hill. Everywhere else you go either up or down, and every street is crooked.

All types of church architecture are represented on these crooked streets, from the unpretentious little primitive Christian chapel of St. Jean, part of which dates from Roman times, on through temples of every size and style and idea the creative centuries produced, past amazing Romanesque Notre Dame la Grande—an edifice so bizarre, so astonishingly carved and decorated, it seems more like a Hindu temple than a church—and on to the cathedral, with its remarkable southern Gothic interior, given perspective and beauty by the adroit narrowing and lowering of the lofty arches. It is the most astonishing ecclesiastical medley imaginable, with quite as much emphasis upon harmonic discords as upon the dignity and proportion that so distinguish most of the churches of France.

THE PEASANT WOMEN OF NORTHERN FRANCE

Simple in their tastes, industrious in their habits, devout in their beliefs, unselfish in their social relations, the peasant women of France are able to make the best of a great calamity like the present war, the outcome of which will be determined as much by the devotion of the women to their country as by the devotion of the soldier to his flag.

HOME INDUSTRY IN THE NORTH COAST REGION OF FRANCE

"The roofs are a joy, simply thick rolls of straw laid close by the farmer and cemented together by Nature in a few months with moss and flowers" (see text, page 395).

BYZANTINE ARCHITECTURE IN FRANCE

Périgueux, the principal city and capital of the province of Périgord, with its grand and beautiful Byzantine cathedral dreaming above the little river Isle, is a cross-section of the Levant. The soft, seductive colors of the gold and verdant landscape, the alluring vistas of the domed city that have somehow no small suggestion of the East, the languorous climate, all aid in establishing the illusion that this lovely region is not in western Europe at all. But why? How did this happen, and what gave the town its eastern personality? (see page 437).

Briefly, during the tenth and eleventh centuries, Périgueux was the headquarters of Venetian merchants, whose trade with the west of France and with distant Britain had perforce to come overland from the south because of pirates at Gibraltar. One result of their traffic was the noble Church of St. Front, now the cathedral. It is a glorious example of the Byzantine, a pure Greek cross in form, crowned by five soaring domes—which reveal St. Mark's as their progenitor—and a magnificently domed and colonnaded spire, or tower, just a yard less than 200 feet in height—the only one of its kind existing in France today.

Apart from the cathedral, Périgueux is a captivating little city, full of old houses that seem never to have been new, one of them half on struts over a miniature sidewalk. Quaint dwellings on the Rue du Lys, smothered with vines and flowers, haven't even a strip of sidewalk; they open doors at the very gutter and let out sleepy dogs and chickens. In the grounds of the beautiful ruined Château

Photo by Lewis S. Rosenbaum

THE ENTRANCE TO THE FORTIFIED ABBEY OF MONT ST. MICHEL, FRANCE

The winding roads are so steep that stairs and paving stones alternate everywhere. This shows the first gateway to the fortified abbey crowning the summit (see page 452)

Photo by Lewis S. Rosenbaum

ANOTHER GATEWAY TO MONT ST. MICHEL

This is a little more than a huge rock, at high tide rising from the water, at low tide resting on the sand, off the coast of Normandy. On its side clings a picturesque fifteenth century village, surrounded by fortifications and crowned by an imposing abbey. This picture shows one of the gateways from the inside. On the right is a famous restaurant, where chickens are still roasted on the spit and omelettes are cooked in long-handled frying-pans over the huge open fire.

ORPHANS OF BRITTANY, FRANCE

Never before in the history of the world have there been so many orphans as there are today in Europe, and yet the process of orphaning a continent goes on with increasing momentum.

Barrière, tablets with terse inscriptions commemorate the gay and gallant days of the age of chivalry and romance by preserving the anonymous fame of a "sweet singer of Périgueux" and "another troubadour."

Nearby, in the green smother of a charming little public garden, lurk relics older than all the rest—the shattered fragments of the Roman amphitheater, so buried in the twisted greenery and flowers they take some finding. Another relic of early days, the lofty, broken-brick cylinder, called the Tour de Vésone, marks the center of the old town of Vesuna, and in its blasted cavern the imaginative soul may still feel himself in the presence of the gods to whom this unique temple was dedicated.

Between Périgueux and Albi is a chain of exquisite river valleys and low mountains, rolling farmlands and daring little hills that look as if they had popped up as perches for an old castle or a crowded town high above the plain. The railroad passes along one side of the vast natural amphitheater called the Circus of Montvalent, whose brutal crags tower up more than 500 feet into the sunny blue. It dives under hills and tears over slender bridges, which seem to be stretched to their fullest tension to span the gorges. Most of the town names here terminate in *ac*, a syllable that makes it impossible ever to forget this region.

Languedoc, the land of *oc*, with its green canals and turbid river Tarn, is a lovely district, where geography has influenced both people and architecture, from Roman times to the present day: a land of great cities and vast wild expanses, of weirdness and goblin fascination. Toulouse, the greatest city of the Midi and the embodiment of its history, is a living testimony to geographical influence. Palaces, houses, donjon library, and churches are built solidly of brick.

WORLD'S NOBLEST STRUCTURES IN CLAY

Toulouse lies in a flat and dusty plain, and the people, recognizing their opportunity, took the clay at their feet and wrought with it in noble structures full of local significance. The most notable, the largest, and one of the most beautiful Romanesque churches in the world, St. Sernin by name, is unforgettable, as it towers above the town, a great red pile trimmed with white. Its lofty five-storied spire hovers above the five handsome apsidal chapels with an effect of grace and symmetry surprising in so huge a mass built of such a material.

The city blooms with beautiful avenues and parks. The Garonne is a picture, with its quaint and ancient mills, its bridges, its great green island, and its innumerable fishermen, who angle from every pier, in every mill sluice, out of boats and trees, and from sand-bars. But these are features. Toulouse would be robbed of much of its character and charm were it to lose its beautiful radiating canals, which link the Atlantic with the Mediterranean through the Garonne. They all meet and mingle in the vast basin of the Embouchure, where trolley-cars empty out merrymakers by the thousand to enjoy the cool beauty of sweeping water vistas between the trees.

MANY NOTED CITIES

It would be hard to find a province where there are so many notable cities as in Languedoc: Albi, whose stupendous fortress cathedral, with walls 157 feet high and a tower like a donjon keep, frowns down from the top of its hill upon the dammed and twice-bridged Tarn; away in the distant hills, Carcassonne (see pp. 458-461), most fascinating and romantic of French cities, the slate roofs of its turreted double walls gleaming silver in the southern sun; Narbonne, with its startling, doubly battlemented Church of St. Just; Béziers, that thrusts out its massive, terraced shoulder to fend off the river and support its cathedral; "Black" Agde; beautiful Cette, a pearl floating upon a sapphire sea, and Aigues-Mortes, walled City-of-Dead-Waters, a dun town whose square battlements command the sickly lagoons where St. Louis laid its foundations (see page 457).

BEAUTIFUL NIMES

Most notable of all is Nimes, a big, healthy-minded, sprawling city full of languorous southern fragrance, rich in splendid avenues, and a park finer than

any other in provincial France, and glorying in the finest Roman ruins outside Italy itself. Right through the smiling, scented heart of the city runs the little walled stream whose source is the cool spring at the foot of Mont Cavalier, that feeds the ancient Roman baths. Every art that man could wield has toiled to make the park and baths lovely beyond compare—landscape architecture, sculpture, hydraulic engineering, horticulture, and all the rest. With its formal eighteenth century urns, balustrades, statuary, and arrangement, it is not Roman now in anything save memory; but it is perfect (see page 464).

The great, shattered amphitheater tells more truly of Roman days, with its terrific masses of masonry and its suggestion of cruel sports; and where two busy streets cross, among the scanty remains of the forum, rises the most brilliant of all the ruins in France, the little "temple of the fortunate princes of youth." It is exquisite—a jewel so rare that not even its brummagem setting can dim the luster of the Greek spirit that infuses every detail of it, Roman though it be. To this day it reveals the breadth and scope of the architectural genius which found one of its loftiest expressions in the valley of the Gardon, a few miles away, when it threw across the gorge the tremendous three-storied aqueduct that is so beautiful because it so perfectly expressed the purpose of its builders (see page 463).

THE FRENCH COLORADO

To the north and west of the great cities and fertile plains lie the wild Jurassic limestone plateaux—from 2,500 to 3,700 feet above sea-level—barren and treeless and almost uninhabited, where the rivers Tarn, Lot, Jonte, Dourbie, Hérault, and their tributaries have hewn themselves deep beds. Most impressive of these is a gorge of the Tarn, a chasm from 800 to 1,000 feet deep and from half to three-quarters of a mile wide, comparable only to our own Cañon of the Colorado.

The walls rise here in sheer precipices, there in beetling heights that sullenly overhang the rushing stream, again in retreating terraces. The eroded rock has been shattered and splintered into a thousand uncouth shapes and gleams in pink, brown, yellow, white, black; now it is veiled with rich purple shadows, now it is cold and gray. Rank verdure adds its delicate greens to the colors of the rock. For 30 miles the cañon twists and bends and winds, now apparently blocked completely by a towering mass, now seeming to slip under a ponderous natural bridge, where an overhanging cliff looks as if it touched the opposite precipice. Then around an angle the little town of Ste. Enimie appears, at the bottom of an astonishing chasm 1,600 feet deep.

A "CITY NOT MADE WITH HANDS"

In this same region is Montpellier-le-Vieux, a phantasmal, ruinous city, "not made with hands." In a vast stony amphitheater Nature has reared, or eroded, the weirdest rock forms imaginable, cut into spires and obelisks, streets and blocks and a citadel, as though giants had built and deserted their savage town within the ramparts of the circumambient hill.

The valley of the Rhône—and Provence! For how many centuries have they not been pathways for conquering nations and an avenue where the world flowed to and fro, leaving its mark in many a stately monument and city? One example is Orange, with its memories of the high tide of Gallo-Roman culture in the beautiful triumphal arch and the most impressive Roman theater in the world (see pages 466 and 467).

THE CITY OF THE POPES

Avignon juts boldly up from the plain on a great isolated rock, from which springs the huge fourteenth century papal palace, a wonderful mixture of prison and fortress and pontifical residence. All about the town the sunny, battlemented walls seem entirely appropriate, and the clattering trolley-cars that dart through the now always opened gates an anachronism. The town is lively with color, and from the attractive park atop the rock the view along the great river, 300 feet below, and across the outlying country is broad and brilliant — wide fields under cultivation, olive orchards and flower-spangled meads that roll up-

Photo by Arthur Stanley Riggs

THE CAP OF THE WOMAN OF ANJOU: ANGERS, FRANCE

Caps are the French countrywoman's index of locality and show her town as well as her province (see page 420)

Photo by Arthur Stanley Riggs

THE CASTLE OF ANGERS, WITH THE STATUE OF COUNT RENÉ OF ANJOU IN THE FOREGROUND

"Although Angers used to be called Black Angers, there is today no brighter, more attractive town north of the Loire. It is a city that has not only fine modern boulevards and buildings replacing its ancient walls, but a perfect wealth of architectural relics that keep its historic past always in mind" (see text, page 420).

Photo by Arthur Stanley Riggs

BYZANTINE ARCHITECTURE IN FRANCE

The Cathedral of St. Front of Périgueux is pure Byzantine, built by the Venetian merchants, who made the city their trading headquarters in the tenth and eleventh centuries and derived their architectural inspiration from their home Cathedral of St. Mark in Venice (see page 429).

ward in gentle slopes toward the grim fort of St. André, that might be a walled city in itself, and below, opposite the broken bridge of St. Bénézet, the former defense tower of Philippe-le-Bel, a shaft of honey against the cloudless sky. But that view pales beside the one from the fort of the gaunt gray rock with its white palace, that grows and grows as it is looked upon until it dwarfs the city and itself becomes the only object in the great flat plain — a towering tombstone over dead ambitions.

Tarascon means unlucky King René's beautiful square castle, that clambers up the rocks of the river bank, a soft-toned medieval picture. At its feet the smooth green mirror of the Rhône, that has reflected so many a chivalric pageant in its day, holds up a quivering counterfeit of the stately structure, with every angle smoothed, every color softened.

The view from the great stone bridge is perfect, the delicate tan of the stones cut clean against the background of embaying trees and azure overhead. And what a scene at sunset on the low hills of the opposite shore! Silhouetted black and spectral against the flaming orb that goes down behind its slender, towering donjon keep, the storied castle of Beaucaire pulses again with life, and one feels the gentle ghosts of Aucassin and Nicolette hovering about the scene of their romance.

ROMAN MEMORIES AT ARLES

What a picture is the old Place du Forum in Arles, where once the togaed Romans gathered! Tall trees fringe it about and shade scores of little tables. The mellow Provençal sunshine dapples the bare earth and dusts with gold the coats of the swart cattlemen of the Camargue, who come here on market days to sip their *apéritifs* before the graceful Roman columns built clumsily into the walls of the hotels.

Unlike Nimes, there is nothing modern about Arles. At every turn is either the medieval or the antique—a statue on the corner of a house here, a yard of elegant Greek cornice there, a Roman carving or a bit of Renaissance frieze; the theater, where the spirit of Greece hovers, Roman though it was, and from twisty, narrow streets wonderful glimpses of the amphitheater, as through a crack in a door. The Cathedral of St. Trophime has a beautiful twelfth century cloister and a porch which is one of the two perfect examples of southern Romanesque work in France; the other is at St. Gilles, not far away. Both porches show clearly and with force and beauty the development of the classic Roman style into the Provençal form of the Romanesque.

A sunlit alley set with magnificent poplars, lined with old stone sarcophagi, leads to the ruined cemetery of Alyscamps, the celebrated Elysii Campi, or Elysian Fields, of the Romans, which grew more and more world-famous and used down to the middle of the twelfth century. None of the handsomest sarcophagi are left there, but some are to be seen in the Lapidary Museum of Arles, which has the most beautiful and important collection in France of magnificent tombs, Roman and Christian, precious Greek statues and figurines, little gems of carving, altars, vases, each telling its own story of culture and achievement.

And the women of Arles! The spirit of all the ages centers in them—Greek, Roman, Saracen, Provençal—types of beauty and dignity as distinct as any of the past. Their costume is the most elegant and distinctive in France—a sweeping black gown, with a sheer white fichu—the hair drawn softly up into a high knot on the top of the head, where it is covered by a bit of filmy white lace and banded with a broad, black velvet ribbon with one short flying end.

RAVISHING FRENCH RIVIERA

It is difficult to say which is the most beautiful section of France. The most vivid and ravishing is the Côte d'Azur, that "Blue Side" we call the Riviera. All the way from Marseille to Vintimiglia, at the Italian frontier, it is an endless floral paradise. Geographically it is a narrow littoral, protected from the fierce north winds by considerable hills behind, and consequently a forcing house for every flower that blows. The rugged coast ranges from the flat sands of Cannes to the iron cliffs at the border, and the col-

Photo by Donald McLeish

A STREET CRUCIFIX IN AOSTA: ITALY

"Other refuge have I none" is a deep sentiment in the heart of the Italian peasant, who finds solace for his sorrows as he bows before the image of Him who said: "Come unto Me."

Photo by Donald McLeish

FAITHFUL FRIENDS OF THE HILLS

Although the burdens of the day lay heavy hands upon the peasant women of Northern Italy and Southern Switzerland, Time touches them gently, and keeps their hearts young, so that beneath the wrinkles, which are the scars of life's battles, there dwells a spirit of kindness and hospitality.

Photo by Donald McLeish

A SWISS GOAT BOY'S FAVORITE

The boys of Switzerland take to the rifle as naturally as a bird to the wing, and long before they are old enough to take upon themselves the burden of contributing their mite to the national state of preparedness, they are adepts with firearms and skilled as mountain climbers. They are as rugged of health as their land is of topography.

A SHOP IN THE LAND OF THE MAMELUKES

Will it yet come to pass that the issue in the present great war will be decided in the land of the Mamelukes, where Napoleon's appeal to his soldiers about the forty centuries that looked down upon them did not bring the ultimate victory he sought?

Photo by Lehnert & Landrock

A JEWISH READER OF THE SYNAGOGUE

From the ends of the earth have Jews gone up to Jerusalem to weep on remembering Zion. This ancient son of Israel journeyed there from Tunis to spend the remaining days of his life.

Photo by Donald McLeish

A FAIR SAVOYARD IN HER LAUNDRY

Descendants of a brave and sturdy race, the women who live around the base of Mont Blanc borrow the purity of its snows, the grace of its outline, and the industry of its streams, and even a day with a mountain torrent for a washtub cannot deprive them of any of these.

Photo by Donald McLeish

A HIGH PASTURE ON THE SWISS-ITALIAN FRONTIER

One is ever and anon surprised at the high altitudes at which, in summer, he finds sleek cows and well-grazed goats in the Alps. The verdure of early summer and the snows of mid-winter seem to wage perennial warfare for possession of the great mountains.

Photo by Donald McLeish

A SAVOYARD AND HIS TEAM ON THE FRENCH SIDE OF LAKE GENEVA

The man who but yesterday never knew a sterner duty than to urge on his gentle oxen, today stands in trenches, where the actualities of modern war make the fancies of Dante's Inferno seem tame and feeble in comparison.

Photo by Donald McLeish

THE COLONNADE AT THE ENTRANCE OF ST. PETERS: ROME

Founded by the Emperor Constantine, at the request of Pope Sylvester I, over the grave of the Apostle Peter; its dome the handiwork of the great Michael Angelo, the church of St. Peters stands today one of the noblest monuments to the Christian faith in the world.

Photo by Donald McLeish

SONS OF SUNNY ITALY

Who can think of such jolly-faced lads as these called to battle at once with man and nature in the high altitude of the Alps that lie between Italy and Austria-Hungary. And yet thousands of the flower of Italy's young manhood are fighting in regions where it is a heavy task to keep step with nature alone.

Photo by Donald McLeish

A ROMAN FLOWER GIRL

With cheeks that match the freshness of the flowers she offers for sale, with a disposition as bright as the climate of her sunny Italy, the Roman flower girl is to be found wherever there is promise of a sale in every Italian city. Business may be dull and prices low, but the flower girl seems always content with her lot.

Photo by Donald McLeish

MAIDS OF EVOLENA: SWITZERLAND

Evolena is the metropolis of the beautiful little valley, Val d' Herens, six hours journey from the Rhone, situated in a broad green basin flanked with pine-clad rocks. The fact that the place has long been a summer resort has not served to spoil the rustic simplicity of the peasant folk roundabout.

BRETON SISTER AND BROTHER

Alas, that such innocence as this must know the cruel pangs of watching and waiting for father and brother who went out to fight for France and came down to die for her!

Photo by Arthur Stanley Riggs

THE HISTORIC ABBEY FORTRESS OF MONT ST. MICHEL: FRANCE

Nowhere along the coast of France is there a village more picturesque, a fortress more historic, or an abbey more strikingly situated than one finds at Mont St. Michel, a wall-surrounded stronghold perched on a rock in the Bay of Cancale, a bay, bare at low water, but noted for its quicksands and the treacherous rapidity of its rising tides. Neither the English nor Hugenots ever were able to capture this pinnacle-planted town, which is now connected with the mainland by a causeway.

Photo by Arthur Stanley Riggs

THE ISLAND OF ST. HONORAT: OFF CANNES, FRANCE

There is no lovelier spot along the entire Riviera than the little island of St. Honorat, where fifteen centuries ago the monks built this gem of a castle-monastery to guard them against the terrible Barbary corsairs.

TWO BRITTANY GIRLS

While the war has spared Brittany from the tread of its iron heel, it has called from its homes every man able to bear arms in defence of their fair land.

ors from one end of the spectrum to the other. It is a blue shore—aye, and an emerald, and red, and black, and brown, and gray.

At Hyères its sensuous charm first becomes apparent in foliage and climate and color—and you remember the violets the street arabs sell in Paris at Easter. The flashing Gulf of St. Tropez, with its high shores and vivid colors—red cliffs, astonishing villas, with majolica tiled walls in every conceivable barbarity of color-combinations, emerald sea and white foam—is a dazzling prelude to Roman Fréjus, with its dull brick ruins of the days of the conquering Cæsars and its medieval houses, with wonderfully carved doors and portals. Cannes, the "Millionaires' Paradise," with its ancient fishing town on the long promontory at one side, surmounted by the gaunt old Tower of the Chevalier, and the new, fashionable section of magnificent hotels, villas, and gardens, shows how everything else can give place to sheer beauty and charm.

Of all the captivating spots along the Riviera there is none lovelier than the little island of St. Honorat, just off Cannes. At one edge, rising from the green water like a great square shaft of glowing amber against the warm southern blue, is the battlemented convent-fortress the monks of old built as a refuge against the Barbary corsairs—a pile stern and militant without, but within a monastery, with a two-storied cloister of remarkable beauty even in its ruin. And at harvest time the few monks who still inhabit the island give from a distance an old-world picture of women haying, their long black robes pinned up, their heads hidden in big, floppy farmer hats. Beyond "the meadows sweet with hay" the ground is all one deep, soft, aromatic bed of brown pine needles, and the old trees bend lovingly over to caress the shining water (see page 453).

NICE, THE POPULAR

Nice, the popular, drowsing along the magnificent Baie des Anges; Monaco, the rock, jutting forth like a great head, with its touseled hair full of flowers; Monte Carlo, on its superb hill, with the gambling casino, poised midway between sea and sky, in a garden which is a riot of almost tropical luxuriance and dazzling color; Mentone, of the soft tints and mild, perfumed airs, are only suggestions of the scenery through which the Grande Corniche road winds for mile upon mile of beauty that only a catalogue can render.

There are towns here all garden; others all rock, perched precariously under their towers within high walls upon a spike of hill, where space is too precious for anything but tenement-like dwellings, and a single, narrow, twisting road leading down to the world; and still others, like Antibes, jammed together on the beach, buttressed house upon house holding hands, as it were. At Antibes, too, a little cape thrusts out into the sea, solidly overgrown with daisies, a vast white and gold finger, like a huge streak of foam upon the waters.

HEART OF THE PERFUME INDUSTRY

But all the beauty is not along the coast. A few miles inland, at Grasse, the French perfume industry has built up flower plantations 1,000 feet above the sea and turned the whole countryside into solid masses of flowers—jasmine, roses, violets, orange blossoms, tuberoses, pinks—more than 12,000 acres of them, raised to be destroyed in the distilleries which have transformed ancient convents into factories whose very smoke smells sweet (see page 472).

Grasse itself has its feet in these wonderful gardens, and climbs laboriously up the terraced hill until its towered head rises clear—a town of villas so smothered in cascades of flowers and palms, aloes and oleanders and cactus that often the houses are invisible from the street.

To the east of Grasse, the narrow-gauge line of the little Sud Railway plunges recklessly over terrifying gorges on heaven-high viaducts that twist themselves nearly double to get across the ferocious chasms, full of distorted rock shapes and unearthly noises. Le Baou, a towering crag like Gibraltar, looms above the miniature town of St. Jeannet, a threatening monster.

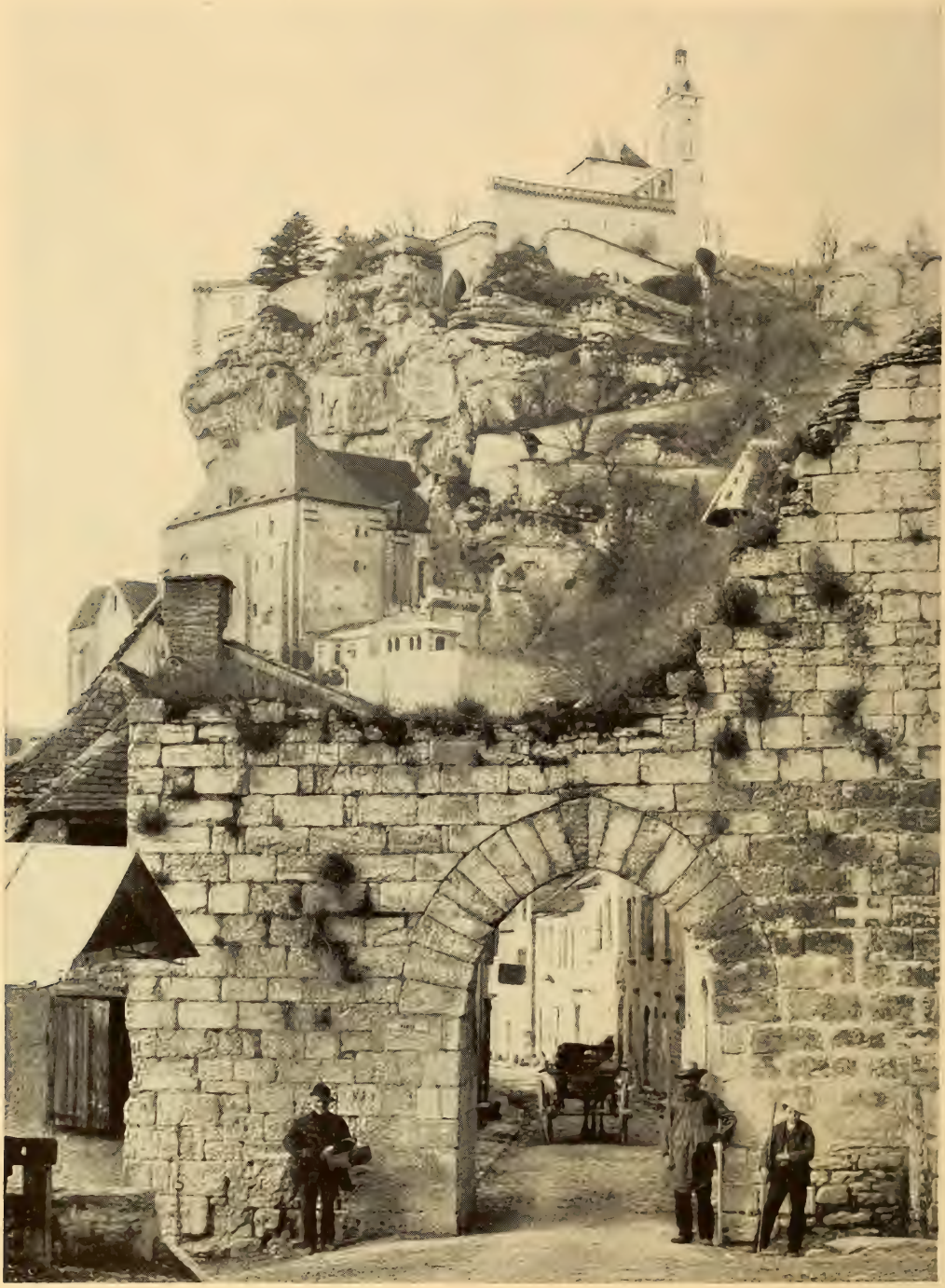


Photo by Arthur Stanley Riggs

THE HOME OF ZACCHÆUS, THE PUBLICAN: ROCAMADOUR, PROVINCE OF GUYENNE, FRANCE

Few towns, even in France, can rival Rocamadour in its picturesqueness of location and quiet, ancient charm. The church at the crest of the cliff is that of St Sauveur, begun in the thirteenth century. In its crypt reposes the ashes of St. Amadour, believed to have been Zacchæus the publican, who is reputed to have labored here in the first century.

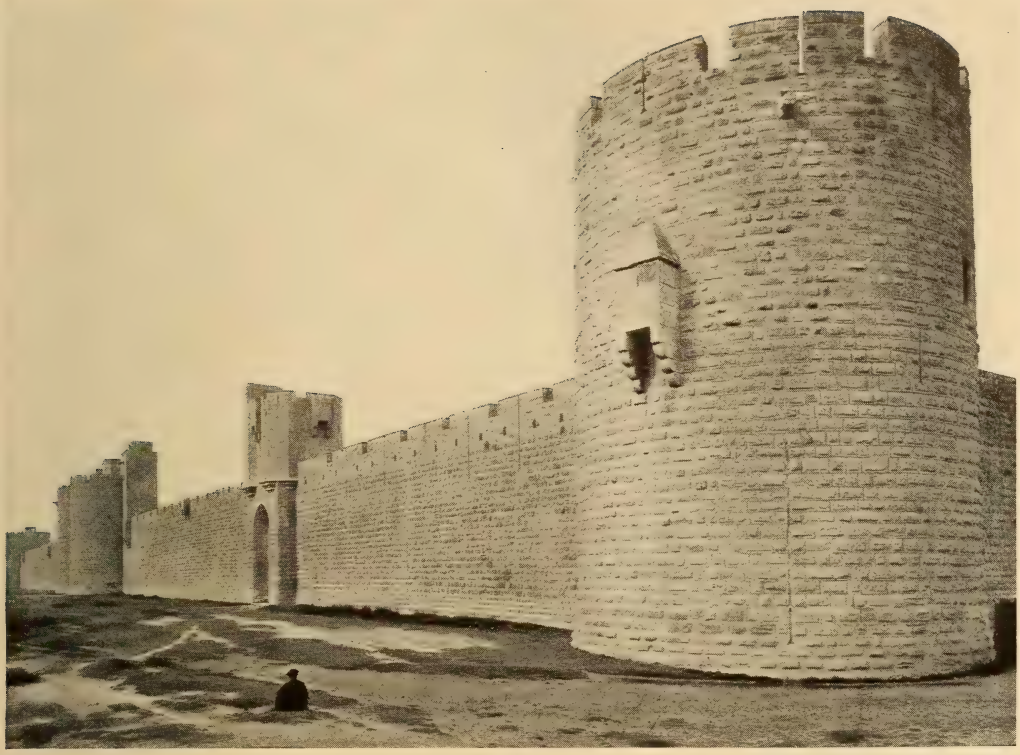


Photo by Arthur Stanley Riggs

THE FORTIFICATIONS OF AIGUÉS-MORTES: LANGUEDOC, FRANCE

One of the best examples of early military engineering in France. The fortress forms a rectangle 600 by 300 yards, with walls from 25 to 33 feet high (see text, page 433)

Northward, the scenery grows more mountainous, with an endless succession of dim ravines, deep gorges, towns here and there of houses rising one above the other in such close tiers they seem primitive skyscrapers of myriad stories. Again, the most incredible "houses," actually built under great isolated boulders, and looking as if a good rain or a slight shock of earthquake would throw them down with a crash.

PICTURESQUE MOUNTAIN TOWNS

Entrevaux, the quaint, unspoiled little town of Between-Valleys, crouches picturesquely between a rushing blue stream and the mountain side. Stout walls, which include the side of the ancient church, with guardian bastions and towers, straggle along the river and up the granite crag to the ancient citadel. A narrow draw-bridge over the river, with its portcullis still in place, gives entrance to the town, where the streets are so narrow one must step into a doorway to let a panniered mule go by.

There is no room in Entrevaux for the usual beautiful French gardens; but tiny, terraced *potagers* — kitchen gardens — fairly hang over the river outside for those who do not care to go to the farther bottom-lands. The children are shy and beautiful; their elders charming, simple souls, and all are uncontaminated by foreign influence and money.

Another picturesque mountain town is Sisteron, which curves around a big gray crag crowned by an imposing old citadel and pierced, like Gibraltar, with tiers of embrasures for cannon. At its feet the dancing, sparkling, blue Buëch sweeps a broad moat about one side of the hill before it cuts a vivid gash into the heavier gray tide of the Durance, which moats one side of the town.

The main street is a one-reel moving picture. Here a young girl, fit to pose for a Raphael, sits on the sidewalk grind-

Photo by J. A. Welker

THE OLD FORTRESS CITY OF CARCASSONNE, FRANCE

Carcassonne dates from the Roman period, but attained its first importance under the Visigoths at the beginning of the fifth century. It is regarded by many as "the most fascinating, romantic, and wonderful of French cities" (see text, page 433)

Photo by J A. Welker

A SECTION OF THE CITADEL WALLS: CARCASSONNE, FRANCE

Viollet-le-Duc, who restored the crumbling walls in 1855-1879, considered them the most perfect and picturesque example of defensive works in Europe, dating from the eleventh and thirteenth centuries.

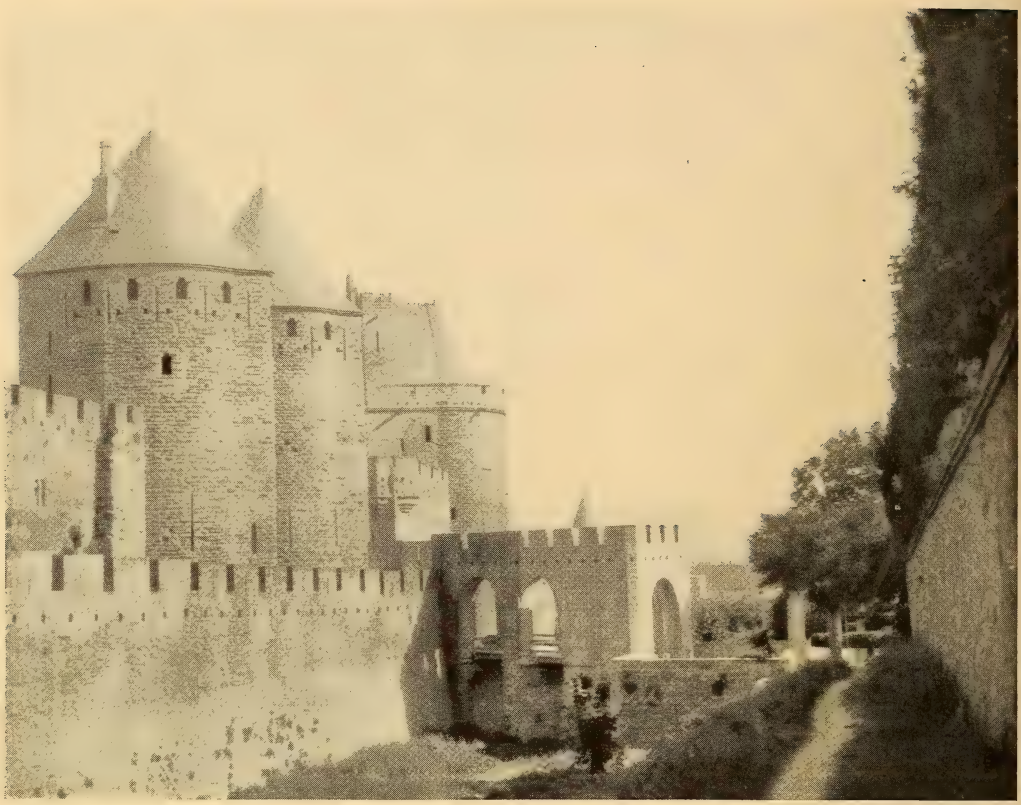


Photo by Mrs. A. H. Harris

ANOTHER VIEW OF THE WALLS OF CARCASSONNE, FRANCE

The citadel of Carcassonne was regarded as possessing so much "preparedness" that it was deemed impregnable and remained intact down to the French Revolution. In a single one of its barbicans, or strong towers, 1,500 defenders could be housed.

ing coffee; there a stout matron dams the rushing mountain gutter into a lake, so that she can swab off the front of her *débit des tabacs;* down a steep alley the street cleaners—a lazy man, a tired woman, and a brisk little girl—and a handful of farmer women, with pitchforks and enormous hats, move like figures on the screen. And in the principal plaza, before the remarkable old church, gypsies camping make another picture against the soft background of the Roman walls, in one of whose blasted towers a full-grown tree peeps through the windows and the open top.

All through this southern region there are astounding rock formations—mountains in the guise of giant heads, with vertical ridges up the middle of their backs, like the crests of ancient helmets; others, square of top, like walled cities, symmetrically flanked by low lines of carefully planned fortifications and outworks (see page 474).

ITALY AND SWITZERLAND MEET IN FRANCE

Dauphiné has been called an "Italian Switzerland" by the French themselves, for it has the sunny skies and rich vegetation of the Mediterranean Peninsula and the cold, stern, snow-capped mountains of the Swiss. The most characteristic feature of the province is its vivid contrasts: tremendous masses of granite pyramids, bare and blasted and savagely desolate; long stretches of primeval forest, pines and firs of noble girth and height, from among which here and there huge rocks leap up like uncouth animals of another age; smiling pasture lands and farms, cut by profound gorges; stormy-looking peaks starred with glaciers; tiny hamlets nestling among the pines; milky roads and sky-brushing sierras of needle-

Photo by Mrs. A. H. Harris

TOWERS OF THE CITADEL: CARCASSONNE, FRANCE

The castle of Carcassonne adjoined the outer wall, so that if all other defenses failed there might be a possibility of communicating with relieving forces from the outside after the town had fallen.

like peaks; deep, irregular, narrow little gorges, each with its rushing, boiling torrent far down among the contorted rocks of the bottom.

The engineering difficulties throughout Dauphiné are exceptional. Along the railroad half the scenery is black tunnels and stinging clouds of cinders. But one cares not a whit for that when the train bursts from them upon spidery, inspiring viaducts, and goes zigzagging up or down the mountain side in graceful spirals that deprive one alike of speech and breath.

ON THE ISÈRE STANDS GRENOBLE

Where the cold gray flood of the Isère slips between the mountains like a thread, we find Grenoble, superbly placed at its junction with the Drac, in an exquisite plain, swept about on every side by range upon range of glorious mountains that tower up 10,000 feet, into the realm of perpetual snow. Bastioned, turreted walls leap picturesquely up to the forts on the top of the hill on the other side of the river. The fifteenth century Palace of Justice, with its high-pitched roof, bold dormers, and elegant chimneys, is said to be the finest Renaissance building in the valley of the Rhône. The handsomely towered Hôtel de Ville has a very effective formal garden.

Indeed, Grenoble blossoms with gardens, and one of its tree-decorated avenues runs straight as an arrow's flight five miles out into the country to the Drac, where the seventeenth century Hurdle Bridge (see page 478) humps its back for the leap across the stream, and gives an exquisite picture, in the rough frame of its arch, of the peaks beyond. But grandest and most inspiring of all is the scene every evening when Mother Nature reveals her fiery alchemy

Photo by Mrs. A. H. Harris

THE TWENTIETH CENTURY AUTOMOBILE IN A SIXTEENTH CENTURY STREET: CARCASSONNE, FRANCE

in sunset and nightfall. Nothing short of an heroic poem can do justice to the marvelous transformation—the flood of ruddy lavender fire that suffuses sky and snow peaks, tints the gray old town, and fires the Isère for a few all-too-fleeting moments before the coming of the terrible, tangible green that succeeds and quenches it, leaving the silent town pallid and sere, and the slow, tender darkening of sky and water and air to the crystalline azure of the southern night, flecked with the gold of star and light in heavens and city.

MOTHER-HOUSE OF THE GRANDE CHARTREUSE

What a spot St. Bruno and his six austere, silent companions chose for their monastery, which became the Grande Chartreuse, the mother-house of the Carthusian Order! Here is a sloping, sunny mead, embayed by dense pine forests, 3,000 feet above the sea, and dominated by the towering limestone crag of the Grand Som, that rears its savage crest still 3,600 feet higher. Surely no more ideal location could be found for ascetics who wished to live in holy solitude and mortify the flesh. Here the fathers lived in their cells, really small two-storied houses, each with a woodshed and workshop on the ground floor and a little garden outside.

What we see of the convent today belongs to the State. It is a tremendous walled inclosure, filled with ugly seventeenth century buildings, whose high-pitched roofs, however, give them a certain distinction. The monks, exiled by the Separation Act, now reside in Tarragona, Spain, where they may pray and distil their famous liqueur undisturbed. Deserted though the convent is now, there is still a grim spirit to it that gives one the sense, especially in the grand cloister, more than 700 feet long, that the sort of life lived here for centuries can never be entirely forgotten or ignored.

Of the many magnificent views along the driving road between Grenoble and Aix-les-Bains, there is one in which, at the mouth of a lofty tunnel, Nature has painted a sublime picture. Right below the road winds in one vast horseshoe curve and a whole series of smaller ones down the blue and green foothills into the rolling plain where Chambéry nestles, all red roofs and tan walls. Away in the distance Lake Bourget turns its sparkling sapphire toward the sun between high inclosing mountains gemmed with stately and commanding châteaux. Scarlet poppies lift their hot tongues of flame

Photo by Arthur Stanley Riggs

A FEW MILES FROM NIMES THE ROMANS FLUNG THIS WONDERFUL AQUEDUCT ACROSS THE VALLEY OF THE GARDON

It stands 160 feet high and is as full of grace as it was of utility (see pages 433-434)

through the fields and beside the milky roads; buttercups and mustard gild them.

CRADLE OF THE SAVOYARDS

And Chambéry, in the sunny heart of this colorful panorama, is not less temperamental than its setting. It delights the dreamer with its profound air of mystery; with its passageways that burrow ostentatiously under whole blocks of houses in every direction, making it possible to traverse much of the town without using the streets; with its tremendous castle—now a police station—that cradled the Savoyard dynasty, today upon the throne of Italy; with its river that loses itself in the main square; and with its rustic charm of a shepherd and his flock on the principal thoroughfare.

The country between Grenoble and Lyon, after the crags of Dauphiné are left behind, is no less magical, though in a quieter way: soft pastorals that unroll in placid succession; tiny towns on gentle swales that seem ancient woodcuts come to life; cows cropping the rich grass or ambling home to their rude byres beside farm-houses guarded by straight old poplars; now a Spanish-looking town, all made of mud; hedge-rows not too tall to keep sleek goats from nibbling at their tender tops.

RICH, INDUSTRIAL LYON

Lyon might be called the New York of France, a great manufacturing city, its heart on the tongue of land at the confluence of two great rivers, the Rhône and the Saône, and dominated at one side by a towering palisade, on whose very summit rises the monstrous modern Byzantine Church of Fourvière. The people inevitably suggest Americans—the beautiful women gowned with taste and restraint; the men broad-shouldered, energetic, and alert; the flocks of pretty children well dressed and with charming manners, while what one sees of the life of the city is as spirited and delightfully refreshing as the cool floods that sweep past its long quays.

It is a beautifully arranged city, which

Photos by Mrs. A. H. Harris

THE ARENA OF NIMES, FRANCE

The city of Nimes is said to contain more monuments of antiquity than any other place in France. The arena, the temple dedicated to the nephews of Cæsar Augustus, the Temple of Diana, and the Great Tower are a few examples (see page 434)

has taken full advantage of its situation. Its twin rivers, spanned by 22 handsome bridges and dotted with battered public wash-boats, are lined with superb, tree-shaded quays on all sides. There are miles of other fine streets and many parks and squares—the fashionable Bellecour, with its ponds and swans, its café and bandstand; the Terreaux, with its monumental fountain of the rivers and springs, its flowing crowds and fluttering pigeons. The less noted squares, each with its monument embayed in flowers, are unusually attractive because of the French genius for design and location. In one square no less than nine great streets are focused, thus giving flower beds and monument their happiest effect.

Imposing modern commercial and public buildings in no way detract from the interest of the remarkable Cathedral of St. Jean and its attendant, the incrusted and arcaded eleventh century Manécanterie, or Choristers' House, or from the quaint Romanesque Church of St. Martin-d'Ainay, with its inlays of colored stones and its tower with acroteria. A superb view from the balconies of the tower of the Fourvière Church sweeps a hundred-mile circle of city and plain, fenced in by snowy peaks, among which Mt. Blanc is clearly visible in good weather.

A FIELD OF STILL VOLCANOES

There is probably no part of the world in which prehistoric volcanic action can be so easily studied and understood as in the old province of Auvergne. It is warty with three groups of extinct volcanoes, and bubbles with important medicinal springs; it is full of rural beauty and urban significance in architecture. The volcanoes are so symmetrically round-topped, they must have looked like titanic old-fashioned coke-ovens when they were "going." Now, cooled off, they are rich in the most fertile of soils.

One has an excellent observatory for this on the tram-funicular that ascends the Puy de Dome, opening at every turn some new and inspiring vista of the round heads of the domes fading into the distance, their dark flanks splashed with vivid yellow gorse, oblongs of grain or plowed earth, fired suggestively with poppies, and touched in places with clusters of enormous, tigerish violets striped with black.

The coming of a storm is marvelous; you seem suspended in vacancy, while the tops of the domes whirl away, one after another, and vanish into emptiness long before the charging rain clouds blot out the world below. Curious grottoes, innumerable glancing cascades, and little mountain lakes add to the interest and beauty of the region.

Clermont-Ferrand—Bright Mount, because of the sunshine that floods it, while the neighboring domes are swathed in fog and mists—is anything but a gloomy place, though built almost entirely of black lava. The inhabitants are as sunny as the town, from those old folks and children who sun themselves in the high Place Poterne, with its views of the domes, to the sleek goats, who stroll after their piping herdsman through the large and handsome Place de Jaude, while the sidewalks, filled with chairs and covered with bright awnings, shelter a cosmopolitan throng sipping its tea and *apéritifs* to the music of string bands.

Here once more we find that architecture has strikingly adapted itself to the material resources of the district and the habits of the local builders. The notable Church of Notre Dame du Port is a typical specimen of the Auvergnat style of Romanesque, with its black and white volcanic inlays, curious pedestal above the crossing as a support for the octagonal tower, and four symmetrically radiating apse chapels.

A HIGHLAND SPA

Nearby is the famous spa of Royat, with its little town behind in the hills, straggling along the edge of a precipitous gorge, whose black walls drip vines and flowers that fringe wet grottoes where laundresses splash and sing. An amazing old battlemented church, founded by Benedictine nuns 1,200 years ago, with crazy, crooked houses jammed close about it, dominates the town, and sets off charmingly its raggedy, spirited population of men and women market gardeners, who think more of their strawberries

Photo by Arthur Stanley Riggs

THE RUINED FACADE OF THE GREAT ROMAN THEATER AT ORANGE, FRANCE

Considered the finest and most imposing structure of its kind in France, notwithstanding that it has lost almost all of its superficial decoration. This façade is 121 feet high and 338 feet long. Every August in peace times the Comédie Française gives a series of performances in the theater (see text, page 434).

than of their historic and picturesque background (see page 483).

Nevers — and New Hampshire! A main street, with neat, separated houses set well back from the precise sidewalk, the blinds down to keep out the sun that dapples lawns and road with gold. But there the similitude that strikes one at first ends; for Nevers is crowned with a kingly old feudal chateau—now the Palace of Justice—that frowns down upon the great, lazy serpent of the Loire smiling indolently back of it. And there is the strange, double-ended Cathedral of St. Cyrus and the magical old square city gateway, called the Croux, with its protecting barbican and outworks, as perfect a picture of medievalism as any artist ever dreamed on canvas.

Toward Bourges the landscape suggests nothing in the world so much as Sicily, with a blaze of purple and gold, scarlet and white and green in countless masses of delphinium, mustard, buttercups, poppies, and daisies that ravish every sense. It is the most brilliant *paysage* in France, and the snowy white cattle, the tremendous horse-chestnuts, towering locusts, sturdy lindens and maples, and the gray, old red-roofed farm-houses that peep between give it solid strength as well as consummate charm. Seeking the Loire, the Allier slips through, broad and shallow, its course marked by de-

Photo by Arthur Stanley Riggs

THE TRIUMPHAL ARCH OF MARIUS AT ORANGE, FRANCE

This arch stands on the road from Orange to Lyon and is regarded as the finest monument of the Roman period in France. It is believed to have been built to commemorate the defeat of Sacrover in the year 25 A. D. (see text, page 434).

capitated willows, sprouting foliage that looks like bushy hair all on end, and skeleton poplars—so many living signposts to say: Here is water.

"HE WHO HAS SUCCESS HAS HONOR"

When one thinks of gray old Bourges, picture after picture forms on the mental canvas, each seeming more beautiful than the others, except Louis XI! Yet even he is fascinating, as he squats in bronze effigy behind the house of Jacques Cœur, a malignant, inscrutable human monster, as strong as he was guileful. His personal idea of diplomacy was, to use his own words: "He who has success, has honor." How far has the world progressed in four centuries?

The Jacques Cœur house is one of the most glorious monuments to the taste and skill of the Middle Ages in existence, a royal palace in size and beauty, built partly upon or with the ancient Roman walls of Bourges. Two of the original towers blend harmoniously with its myriad other decorative features: turrets, gargoyles, beautiful round-cornered chimneys, carved and fretted casements, and, over the main doorway, counterfeit windows, from which stone servants lean out against the coming of the master. No less alluring is the courtyard, with carven stair-towers, coats of arms in *cœurs*

TOILING THAT FRANCE MAY BE FED

AGE MUST COMFORT YOUTH WHEN WAR'S LIGHTNING IS IN THE SKY

Photo by Arthur Stanley Riggs

ONE OF THE LITTLE "HILL CITIES" OF PROVENCE, FRANCE

The little town of La Roquette is one of those wonderful hillmen's homes which were built on the tops of inaccessible crags, so that they would be safe, in the days when any town was liable to attack and pillage without a moment's notice

OUTLINE MAP OF THE PROVINCES OF FRANCE

For a map with more detail, see map of Europe, 28 x 30 inches, in the July, 1915, number of the National Geographic Magazine

(hearts) and scallop shells, bas-reliefs and a series of portrait panels.

Most beautiful of all is the picture made by the public garden and the transeptless side and apse of the stupendous Gothic cathedral, with its forest of slender, flying buttresses. Against this magnificent background range splendid poplars, clipped and trimmed into an impenetrable flat screen; then smaller trees, coaxed into green domes; then the roses, slender, delicate little trees coronetted with fragrant bloom. And in their season, fair and winsome as the roses, the little maids of Bourges thread flowered walks in confirmation dress that makes them the daintiest white blooms in all the town.

THE LAND OF WINE AND VINE

Burgundy, the Golden Side, is a land of vines—vines, vines everywhere, fenced in by the high stone walls of *clos*, growing in the very houseyards until there is room for not a flower or weed, clinging, climbing, wandering everywhere. In the heart of this region is Beaune, a temperamental little city full of pink stair-tow-

Photo by Arthur Stanley Riggs

STRIPPING ROSES IN THE CONVENT FACTORY OF NOTRE DAME DES FLEURS: GRASSE, FRANCE

"But all of the beauty is not along the coast. A few miles inland, at Grasse, the French perfume industry has built up flower plantations 1,000 feet above the sea and turned the whole countryside into solid masses of flowers—jasmine, roses, violets, orange blossoms, tube-roses, pinks—more than 12,000 acres of them, raised to be destroyed in the distilleries that have transformed ancient convents into factories whose very smoke smells sweet" (see text, page 155)

Photo by Caroline Robinson

THE DISTAFF SPINNER OF GOURDIN, NEAR CANNES, FRANCE

ers, bulgy turrets that seem to have attached themselves to their houses by accident, funny little balconies, and saintly images over the doors.

But always and everywhere it is a town of wine, the rich, heady red of Burgundy. Wine permeates even the courtyard of the lavish old Hospice of Beaune, where at one time the Fete de Dieu is held among priceless old tapestries, and at another an auction, which fixes the prices of burgundies for the whole world. The building is Flemish-Gothic, and through the magnificent courtyard, with its striped roofs, carved wooden pignons, and galleries, flit the white-robed figures of the sisters, who dress even yet in the beautiful and stately costume of the noblewomen of the fifteenth century.

The Burgundian capital, Dijon, is a city of ducal memories, with a remarkable Place d'Armes, a huge Palais d' Etat—with its picturesque remnants of the ancient Palace of the Dukes—and the magnificent gilded and painted alabaster and black marble tombs of Dukes Philip

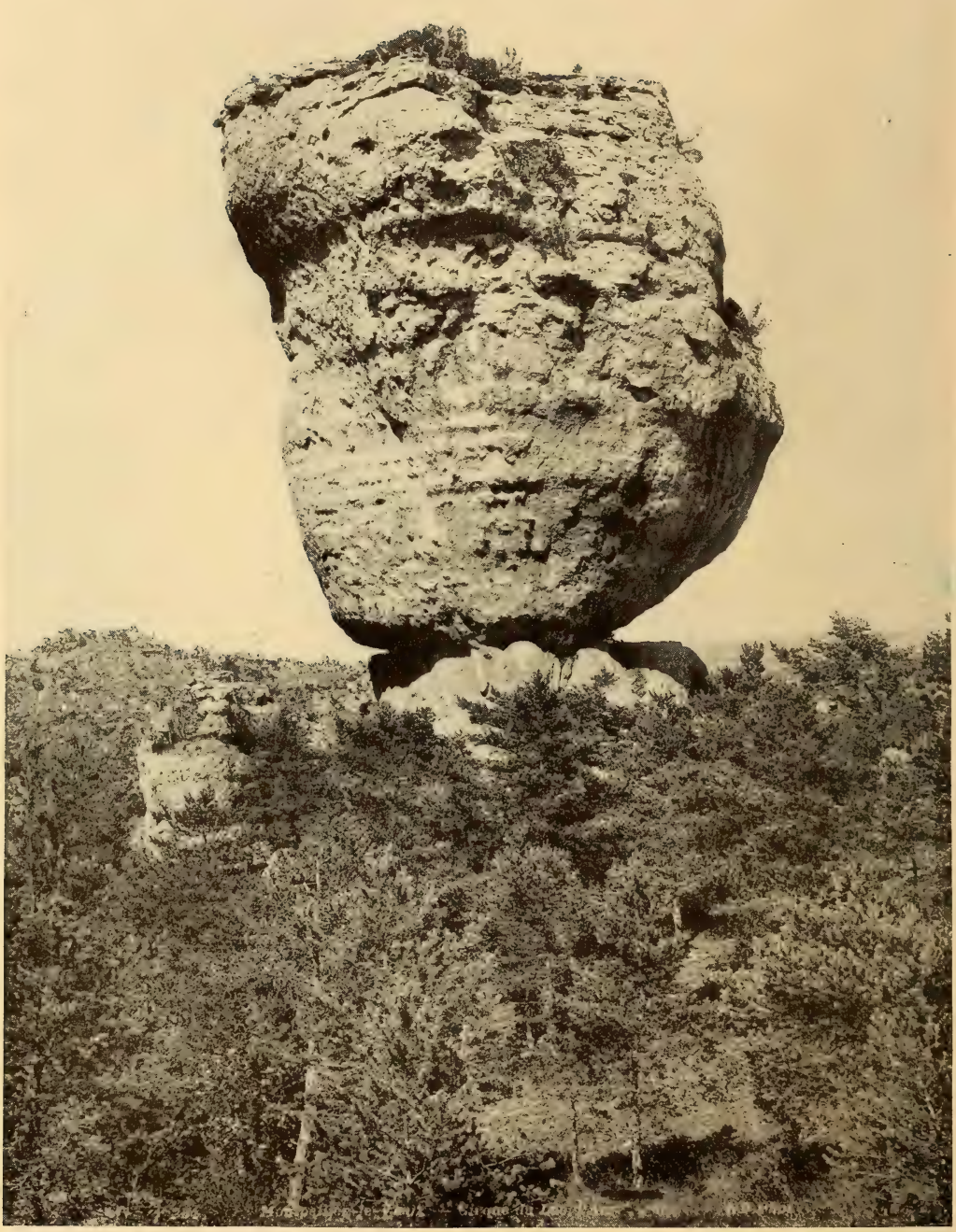


Photo by Arthur Stanley Riggs

THE MARMITE, AN ENORMOUS BALANCED ROCK IN SOUTHERN FRANCE

This is one of what is said to be "a chaos of rocks resembling a ruined city." In many places "houses" have been built under the shelter of such rocks. The trees in the foreground give some idea of the size of this balanced rock (see text, page 434).

the Bold and John the Fearless, with their "world of weepers, who clamor under the intricacies of the delicate arcades."

Dijon's most remarkable church is not its cathedral, but phenomenal Notre Dame, the most brilliant work of the thirteenth century Burgundian school. Above the fine porch each of the two stories is turned into an astounding churchly nightmare by great gargoyles that run the gamut of emotional expression, glaring, sneering, grinning at the pedestrian on whom in wet weather they spout—seventeen to each row—craning their lean necks to catch the unwary.

THE CHAMPAGNE CITY

Whether your point of view is that of the art critic or of the wine connoisseur, Rheims is *the* city of champagne. To the latter the city's show-places are the great and beautiful wine parks, and 75 feet below them, hewn from the solid rock, the miles of white caves or galleries where the sunshine — all in bottles — is aged and "dosed" and stored, millions upon untold millions of bottles of it.

Never in all the history of mankind since the high tide of Greek glory has there been so marvelous and deeply personal an architectural expression of the aspirations and character of a people as the Gothic, and of all its stupendous erections, none was so magnificent, so kingly, so perfect in beauty, as the Cathedral of Rheims. So, too, was its sculpture, figures that represented a mastery which equaled that of the Golden Age of Pericles in classical purity, and, besides that, glowed with an individuality the older masterpieces almost entirely lacked, while the vines and leaves that clambered over pillars and capitals were so instinct with naturalness and life they seemed to rustle as one watched.

What the twentieth century may bring forth, no man can say; but thirteenth century genius cannot be made to live again.

Rheims was a city of wide-open spaces. There are wider open spaces now.

ALONG THE COAST

When John Ruskin pleaded with people to see Amiens and its cathedral, even if they only stopped over between trains, he might also have included the whole of Picardy, for it is as distinguished and varied in its appeal as it is beautiful. "The Golden Sands of Picardy" are a guide-book byword; broad, majestic reaches of firm, clean sand and shining pebbles, perfectly safe for the smallest child (see page 486).

At Wimereux the beach is a huge English family sitting-room, with gay little striped tents and shelters and bathing machines. At Le Portel, a fishing town, where the cliffs open an inverted V to the sea, the French bourgeois disport themselves at reasonable prices, and the native women in picturesque shawls and embroidered caps are the beasts of burden. It is fabled that they carried in baskets on their mighty backs all the great stones and the sand with which their handsome church was built.

Between Wimereux and Portel is the great seaport of Boulogne, with its cosmopolitan forest of masts, its bustling water streets full of Picard costumes and foreign clothes. To one side are the big white Casino, fine hotels, and a trig little park, while high on the hill nestles the original Boulogne within massive walls, now so useless that a good part of them has been planted with shade trees and transformed into an elevated promenade. Away to one side on the cliff towers Napoleon's column, commemorating his "invasion" of England that died aborning.

"PARTHENON OF FRENCH ARCHITECTURE"

Picardy's great monument, however, is the glorious thirteenth century Cathedral of Amiens, the "Parthenon of French architecture," according to Monsieur Viollet-le-Duc, because of its absolute purity of style. Wonderfully beautiful it is, with its fretted towers, its great blazing rose window, its three vast recessed portals, its carven prophets and priests and kings, and the "Beautiful God of Amiens," on the central pillar of the central door, the foundation and central theme of all. One of the rare things about the façade is the series of delicate and spirited quatrefoil medallions. On one of the porches they represent the "pleasant order of the year, the zodiacal signs above," the labors of the months

Photo and copyright by Standard Scenic Company

IN THE MARKET-PLACE: NICE, FRANCE

In normal times a quarter of a million invalids and pleasure-seekers visit this balmy city by the southern sea. The great regattas and aviation meets of yester-year are now forgotten, while all minds turn to the stern realities of war.

below—old man February warming his bare feet at a fire, March working his vineyard, young April feeding a hunting-hawk, and so on (see page 486).

But the outside of any cathedral, except the façade only, is the reverse—the wrong side of the design, simply the warp that makes possible the wonderful, airy, soaring grace and majesty within; where the true scheme of the builder unfolds in the bold symmetry of lofty column, arching vault, jeweled windows, and light-sparkled chancel. And in that chancel at Amiens the most beautiful wood-carving in the world blossoms in the solid oaken stalls, doweled together without a nail or screw or bolt. Heads and figures, ornaments and scrollwork, Bible stories and portraits are there. The tough wood was pliant as putty in the hands of those sixteenth century artists, who could send it writhing upward like twisted flame in 40-foot decorative pillars and mold it into the most delicate of fancies.

Photo and copyright by Standard Scenic Company

STE.-MARIE-MAJEURE CATHEDRAL: MARSEILLE, FRANCE

All the beauty of Amiens is not focused in the cathedral. The miniature Parc René Goblet is pure delight and reanimation; the "soft-glittering" River Somme, parting into numerous crystal streams, transforms the older section into a Venetian picture of canal streets, and out along the river road above the city, by the low island vegetable gardens, picture after picture unfolds—of moated villas, little dye-works that tint the stream blue and red, curious rickety houses with old-fashioned flower gardens, a distant gray cathedral, sturdy farmer women paddling their snaky black boats, which might almost be gondolas brought from Venice.

The finest picture of all is the market in the long, tree-shaded Place Parmentier, beside the river, almost under the cathedral walls. What color and realism in the huge piles of golden carrots, purple turnips, red tomatoes, white cheeses, small mountains of eggs and hills of butter, meat and fish and cabbages. It is a moving picture, to the music of Picard patois jarring against liquid

Photo by Arthur Stanley Riggs

HURDLE BRIDGE, WITH OISANS ALPS IN THE BACKGROUND: GRENOBLE, DAUPHINÉ

The Pont de Claix, or Hurdle Bridge, crosses the River Drac about five miles outside Grenoble. All traffic now uses the level, modern bridge, and the old Hurdle is merely a picturesque reminder of the past (see text, page 461)

FED BY THE ETERNAL SNOWS OF THE FRENCH ALP: THE RIVER ISÈRE, AT GRENOBLE, FRANCE

Photo by Arthur Stanley Riggs

"Where the cold gray flood of the Isère slips between the mountains like a thread, we find Grenoble, superbly placed at its junction with the Drac, in an exquisite plain, swept about on every side by range upon range of glorious mountains that tower up 10,000 feet into the realm of perpetual snows. Bastioned, turreted walls leap picturesquely up to the forts on the top of the hill on the other side of the river" (see text, page 461).

Photo by Arthur Stanley Riggs

THE BANKS OF THE ISÈRE A SHORT DISTANCE BEYOND GRENOBLE, DAUPHINÉ

"The engineering difficulties throughout Dauphiné are exceptional. Along the railroad half the scenery is black tunnels and stinging clouds of cinders. But one cares not a whit for that when the train bursts from them upon spidery, inspiring viaducts, and goes zigzagging up or down the mountain side in graceful spirals that deprive one alike of speech and breath" (see text, pages 460 and 461).

Photo by Arthur Stanley Riggs

ONE OF THE SENTINELS OF THE FRENCH ALPS: THE MEIJE

This peak is one of the most difficult of all those in the French Alps to climb and only the most proficient climbers succeed in reaching its summit. It is the highest peak of the Pelvoux group after the Ecrins. Its neighbor, Doigt de Dieu, has been pronounced so fragile in appearance, compared with the Meije, that it looks as though the first gust of wind would carry it away. It leans toward the Glacier des Etancons in a way that makes one wonder and shudder.

Photo by Arthur Stanley Riggs

AN EXAMPLE OF FRENCH MILITARY ENGINEERING: GRENOBLE, FRANCE

Grenoble is strongly fortified, as it commands an important Alpine pass leading into central France from Italy. Fort Rabot on the right and the Bastille fort on the left dominate the pass in both directions (see text, page 461)

Photo by Arthur Stanley Riggs

A CHURCH TWELVE HUNDRED YEARS OLD: ROYAT

"Nearby is the famous spa of Royat, with its little town behind the hills. . . . An amazing old battlemented church, founded by Benedictine nuns 1,200 years ago, with crazy, crooked houses jammed close about it, dominates the town and sets off charmingly its raggedy, spirited population" (see text, page 465).

THE SHEPHERDS OF LOCHES, FRANCE

Photos by Norma R. Waterbury

ON THE WAY TO MARKET: LOCHES, FRANCE

Photo and copyright by Underwood & Underwood

THE OLD CITY GATE OF LAON, FRANCE

Laon lies back of the German lines in France and is the scene of feverish military activity. It is situated some distance northwest of Rheims (see text, page 487)

THE CATHEDRAL AT AMIENS, FRANCE

"When John Ruskin pleaded with people to see Amiens and its cathedral, even if they only stopped over between trains, he might also have included the whole of Picardy, for it is as distinguished and varied in its appeal as it is beautiful" (see text, page 475).

Photo and copyright by Stereo-Travel Co.

VERSAILLES PALACE FROM THE GARDEN: FRANCE

It is estimated that the wonderful Palace of Versailles cost $100,000,000, besides the forced labor exacted under the old feudal system. The leveling of the ground for the gardens and park, the making of a road to Paris, and the erection of the Aqueduc de Maintenon to bring waters from the Eure are said alone to have occupied 36,000 men and 6,000 horses for years.

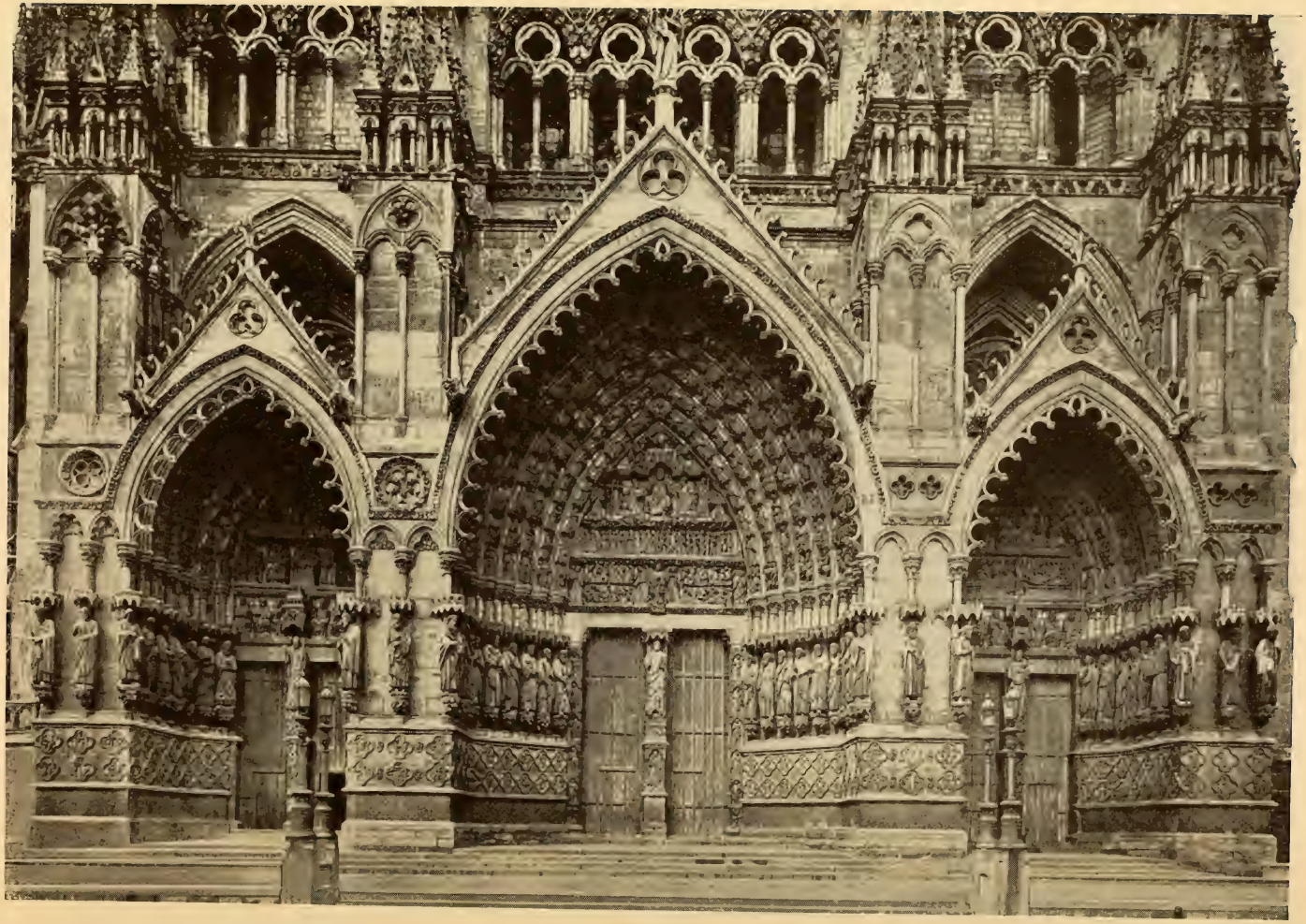
French, the shouting of dealers and haggling of thrifty housewives, and the clinking of silver passing from pouch to pouch (see page 489).

A PERFECT HILL TOWN

Laon spells the perfect hill town, completely cut off from the plain above which it rears, on a great triangular limestone rock. Nature has bitten a huge mouthful out of one side of it, leaving a deep, irregular, horseshoe-shaped valley, full of gardens and fruit trees and pines, whose tops are far below the level of the streets. The lofty cathedral, from whose square towers peer out huge effigies of the oxen that are fabled to have voluntarily helped in its building, adds its note of command to this natural fortress man has further protected. But, as in other cases, appearances were deceptive at Laon, and the military authorities knew better than to put their faith in them, in the face of twentieth century artillery.

The old province of the Île de France numbers many beautiful and historic spots like Laon — great chateaux like noble Chantilly and Pierrefonds, the royal palaces of St. Germain and Versailles, glorious forests and parks and gardens. But these are all so close to Paris and so well known they have small right here.

And as for Paris, who does not know her beauties?—the beautiful quays by the smooth-flowing river, the magnificent bridges, the majestic tree-lined boulevards, the arcaded streets, the narrow, twisty, black little alleys; the illustrious buildings of every age, the stately triumphal arches, the incomparable parks; and on the Île de Cité, the germ and heart of all France, the towering sublimity of Notre Dame, and that jewel of many facets, royal Louis's Sainte-Chap-



THE DOORWAY OF THE CATHEDRAL AT AMIENS, FRANCE

"Wonderfully beautiful it is, with its fretted towers, its great blazing rose window, its three vast recessed portals, its carven prophets and priests and kings, and the 'Beautiful God of Amiens,' on the central pillar of the central door, the foundation and central theme of all" (see text, page 475).

pelle, in its dreary setting of the granite Palace of Justice.

A SUN-DRENCHED CENTER

Most seductive of all the old provinces is Touraine, for centuries the sun-drenched recreation center of France, a richly colored province of gently rolling plains and lazy rivers that ramble leisurely through its verdant fields and mistletoe-draped woods, of one large city and many lovely little towns, of peerless chateaux and grim old castles. Its capital, Tours, is still a Mecca for every nation under the sun, not so much because of its rare houses of another age, its bizarre cathedral or its own attractive personality, as because it is the center from which radiate throughout the province lines of beauty and genius that found expression in the noblest and loftiest secular achievements of France, numberless great chateaux of the Middle Ages and the Renaissance.

Touraine, to a greater degree than any other part of the world, emphasizes in these vast and elegant structures the usefulness and value of pure beauty for the sake of beauty. It also portrays clearly and harmoniously the development of the sumptuous residential chateau from the stronghold pure and simple.

Loches, high upon its hill above the Indre—one of the fair and graceful tributaries of the Loire—is stimulating in its rugged strength and simplicity. Its entrance is terrible, frowning, turreted. Its mile and a quarter of massive walls make it a town within a town; where the roofless, floorless donjon still reeks of shuddering cruelties; where the castle church amazingly roofs itself with four lofty cones or pyramids, and where the faithless Charles VII still dallies with the fair Agnes Sorel in an impressionistic relief over one of the doorways of his white, luxurious hunting lodge.

FAMOUS FRENCH CHATEAUX

Equally high Chinon rears its shattered walls above the placid Vienne. Most of its huge triple castle, where 500 years ago Joan of Arc talked with laggard Charles, is gone; but the enchanting views over silver stream and emerald plain still exercise so potent a witchery it is hard to give due attention to the ancient stronghold.

Amboise bulks huge above the Loire itself, as much residence as castle, yet strong in defense. Its enormous battlemented towers contrast curiously with an ornate, balconied façade, and with its entrancing little gem of a Gothic chapel, all carved and gargoyled and pinnacled. History touched Amboise with bloody hands and moved grimly on to Blois, perhaps the most grandiose and truly royal of all the innumerable chateaux of France. The lofty Francis I wing rises from an old foundation, which is a fortress in itself, into an airy, arcaded, gracious pleasure palace worthy of the king who reared it and his Italian advisers. Within the court is the gem of the whole chateau, the bold, symmetrical, perfect open-air staircase, covered with carving as delicate and clean cut as silversmith's chasing, and exquisite statues by the greatest sculptors of the period. And along the upper walls long lines of savage-looking gargoyles seem a flight of medieval witches and monsters in full cry.

A LABYRINTH OF ANACHRONISMS

Seen from the massive bridge over the Loire, the town of Blois rises in tiers and terraces from the bustling present of waterside commerce up into the historic past. It is a labyrinth of anachronisms. Fascinating houses, with carved façades; others gleaming from top to bottom with slates; and styleless modern dwellings and shops all face upon flowery streets through which clang twentieth-century trolley cars. Great churches hide up black little alleys or face vast, deserted dirt squares, while modern business has plastered glaring advertisements, in colors that shock, upon houses and buildings that ought to be museums of antiquity.

Chambord must be taken for what it is: a great, dazzling butterfly of a chateau forcing its way out of the hindering cocoon of a fortress, neither truly beautiful nor impressive, but interesting as a proof of the progress the chateau builders were making (see page 492).

There is something of a suggestion of the fortress to Chenonceaux, rising boldly

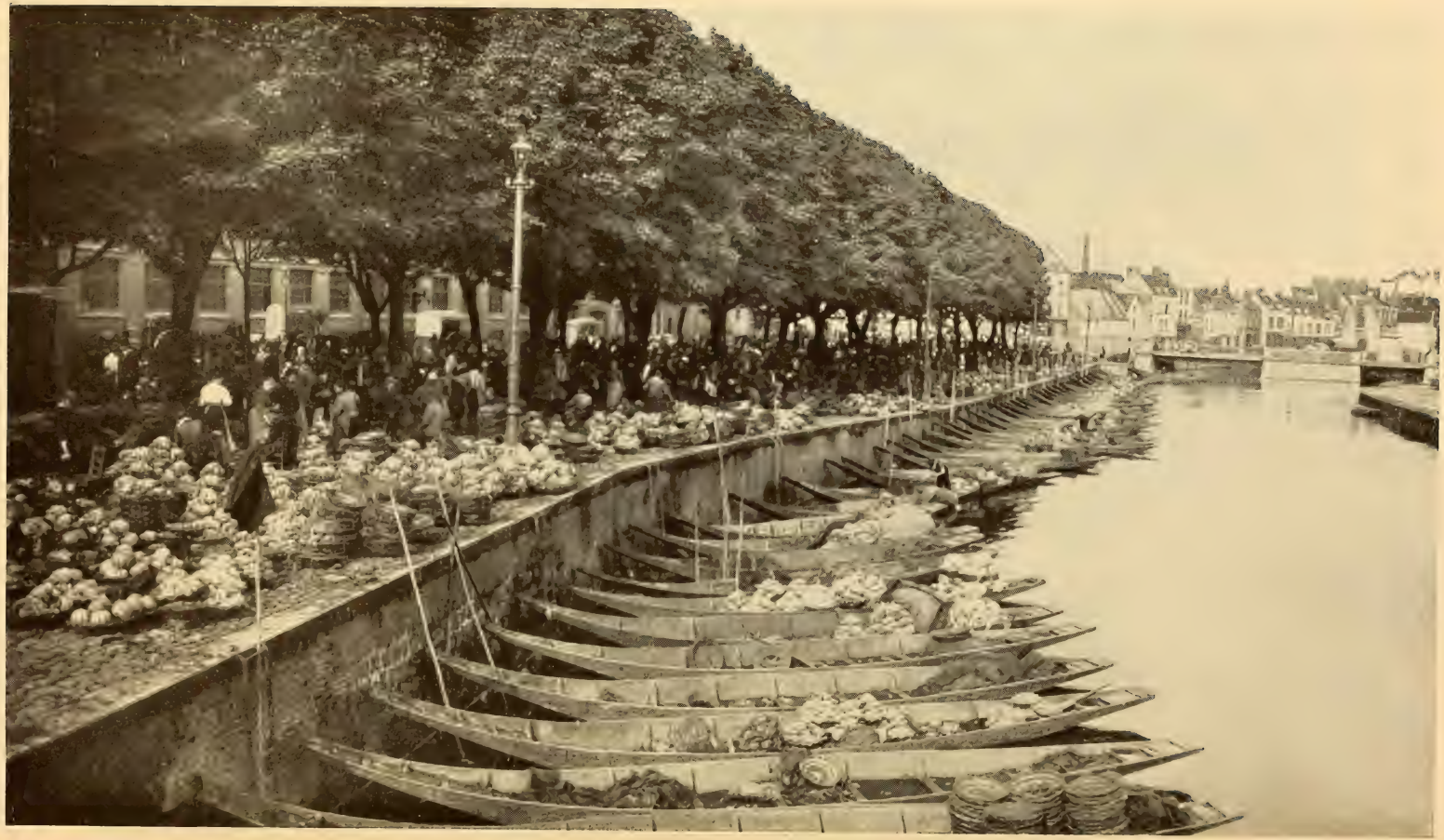


Photo by Arthur Stanley Riggs

MARKET DAY IN THE CITY OF AMIENS

"What color and realism in the huge piles of golden carrots, purple turnips, red tomatoes, white cheeses, small mountains of eggs and hills of butter, meat and fish and cabbages. It is a moving picture, to the music of Picard patois jarring against liquid French, the shouting dealers and haggling of thrifty housewives, and the clinking of silver passing from pouch to pouch" (see text, page 477).

from smooth green lawns before and smooth green water behind, with an isolated keep—remnant of a former castle—and massive construction. Lofty and commanding, its walls blossom with little turrets, with engaging dormers at unexpected intervals and places, with gables and finials and all the delicate, graceful detail the French Renaissance builder knew so well how to apply, while its setting is ravishing, among brilliant formal gardens along the rose-covered banks of the captivating little Cher, across which it throws one thick, arcaded arm sublimely mirrored back in all its gracious coloring and detail.

THE CHATEAU BUILDER'S MASTERPIECE

The climax of the chateau builder's art is reached in Azay-le-Rideau, the utter perfection of residential beauty. Not a trace of its fortress progenitor exists here, but only the genius which could express pure beauty in elegant, slender turrets, lofty roof, exquisitely carved moldings and casements, harmony and balance of every part and detail. No moat surrounds the soft-colored gray walls; but the waters of the unhurried Indre flow in immemorial calm beneath rows of brilliant flowers and expand to one side in a quiet pool gemmed with many little cups of lilies. Azay is so lovely, so complete, so satisfying, it entirely baffles any word of praise or description. It must be seen to be understood and understood before one can appreciate what France has done.

Men have called her La Belle France. Nature gave her all the resources of her inexhaustible storehouse—climate, contrast of scenery, charm, atmosphere—everything lavishly. And in his turn the Frenchman did not fail. With the primitive laws of perfection and beauty before him on every side, he was inspired to dream and to toil, to conceive and achieve, and so to add the human touch to the natural, to round out and complement the gifts of the great Earth Mother.

THE WORLD'S DEBT TO FRANCE

WHEN we reckon the debt that civilization owes to France we very soon discover that civilization, with that remarkable country left out, would be like man without a soul. She has gravitated from one extreme to another—from intense religious conviction to free thinking and back, from absolutism to republicanism and back, from grave to gay and gay to grave, from suffering and sorrow to rejoicing and happiness—until she has become the pendulum of human progress, all the while driving onward the wheels of civilization.

Whether we take her for her ideals of government, for her literature, for her science, or for her intensely humanistic and democratic qualities, France tells us of leadership, of daring to venture like a general born to command, of the establishment of the empire of her ideas and her ideals throughout the world.

Reviewing these phases of her life and history and services to humanity in their order, one naturally starts with those wonderful times men call "The Revolution," for there the modern France was born. Never did a race of people suffer as the French people suffered in those days. Man is not a natural revolutionist. War is a solemn and an awful thing at best, with its sacrifice of life, its vast exactions against property, and its terrible risks of defeat. Peoples, therefore, bear much and suffer long always before they rise in revolt against their own governments.

Never was war more reluctantly engaged in than when the people started the French Revolution. Things had been endured patiently by them for generations. The unrestrained hand of kingly rule that knew no right but the "divine right of kings" had multiplied vastly the burdens of the people until men could endure no longer.

THE THROES OF OPPRESSION

They found themselves and their lives at the disposal of the king. Often they

Photo by Arthur Stanley Riggs

THE FAMOUS CHATEAU OF CHAMBORD: TOURAINE, FRANCE

The Chateau of Chambord shows the attempt of the builders of the middle period to erect structures that should combine the strong defensive qualities of fortress and castle with the refinements of chateau and pleasure palace

were thrown into prison and permitted to languish and die without even knowing the nature of the offenses with which they were charged. Words, indeed, are inadequate to portray the pitiable conditions of the poorer classes through the century preceding the Revolution. They were forbidden to fence their fields for the protection of their crops, lest the fences should interfere with the lord's progress during the hunt. They were even prohibited from cultivating their fields at certain seasons, in order that the game for the lord's bag might not be disturbed. One who saw it all wrote that France had "degenerated into a hospital full of woe and empty of food."

As the French populace looked across the Atlantic to America, whose freedom their country had helped achieve, they saw the Arcadia of their philosophers' dreams realized. The people they had helped set free in the New World were an inspiration, an object-lesson, and an appeal to them. It may well be doubted whether America could have achieved her freedom but for the help of the French and the bell of human liberty she set to ringing. And yet who can say that America did not more than repay the debt by the inspiration and the encouragement she gave to France?

Be that as it may, however, France rose boldly and resolutely to the grim task she had before her of deposing the central doctrine of continental Europe, as it existed in those days, the doctrine of "the divine right of kings."

THE DISTANT THUNDERS OF REVOLT

Even while our Henrys and our Hancocks were thundering at the iniquities of colonial rule in America and crying to heaven for freedom for their country, the distant thunder of the approaching storm in France could be heard. How often had Louis XV sensed its coming in his exclamation, "After us the deluge!"; for he was statesman enough to realize that the sins of extravagance were finding out their authors, and that corruption in high places was becoming such that the body politic could stand it no more.

It was a tottering throne that Louis XV left to his grandson, Louis XVI, and a not-too-strong king inherited it, although he did all he could to stay the storm. He called to his aid the most eminent men of France and consulted with the nobles and the clergy; but every class was ready to surrender the privileges and special favors of all the other classes but their own; so nothing of moment resulted.

Then, for the first time in 175 years, was convened the States-General, an almost forgotten assembly composed of the nobility, the clergy, and the commons.

When the king convened this body, he expected all votes in its deliberations to be taken by classes. In this way the clergy and the nobles could outvote the commons. But when the deliberations began the representatives of the commons determined that voting should be done by individuals. For five weeks the war raged, and the commons, emboldened by public opinion without, took a decisively revolutionary step by declaring themselves the National Assembly and inviting the other two orders to join them, which they later did.

THE BASTILE'S FALL

Then followed the storming of the Bastile, of whose fall the great English statesman, Fox, declared: "How much is this the greatest event that ever happened in the world, and how much the best!"

The subsequent story of the French Revolution is a long and painful one.

All Europe was watching with the utmost anxiety the course of events in France, for the people everywhere knew that the cause of the French republicans was their own, while the kings understood that the cause of Louis XVI was theirs. These kings reasoned that if the French people should be allowed to overturn the throne of their hereditary sovereign, who, after that, would respect the "divine right of kings"? They, therefore, decided to line up with the royalists of France and put down by the power of royal armies the infamous doctrine of the sovereignty of the people and the rights of man.

THE REIGN OF TERROR

On the 21st of September, 1792, the national convention abolished the monarchy and proclaimed the republic. All

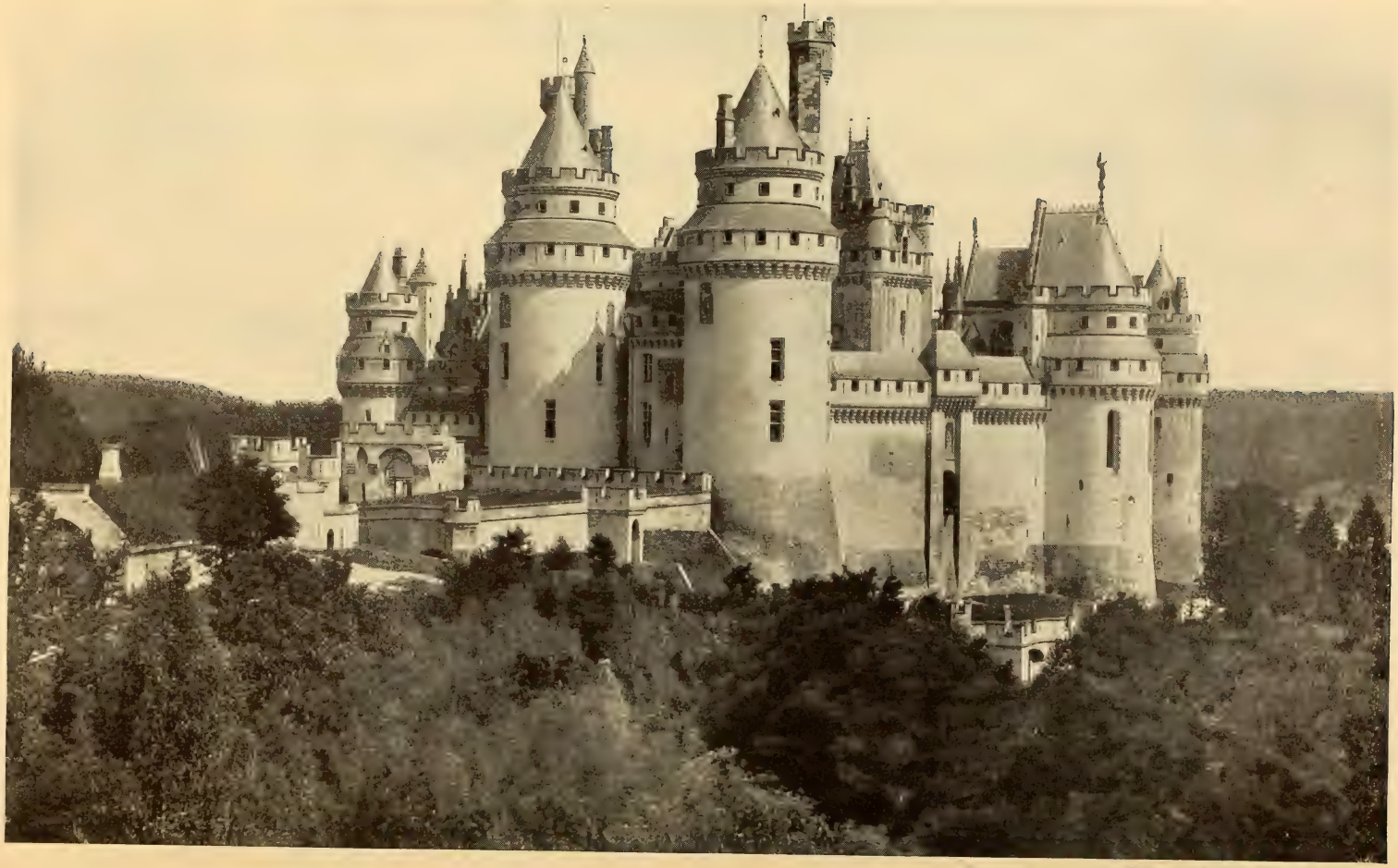


Photo by Arthur Stanley Riggs

PIERREFONDS, ONE OF THE MOST SPLENDID CHATEAUX OF THE ILE DE FRANCE, NEAR COMPIÈGNE, FRANCE

This chateau was begun in 1390. During the French Revolution it was sold, Napoleon Bonaparte being the purchaser. The government finally acquired it and owns it today (see text, page 487)

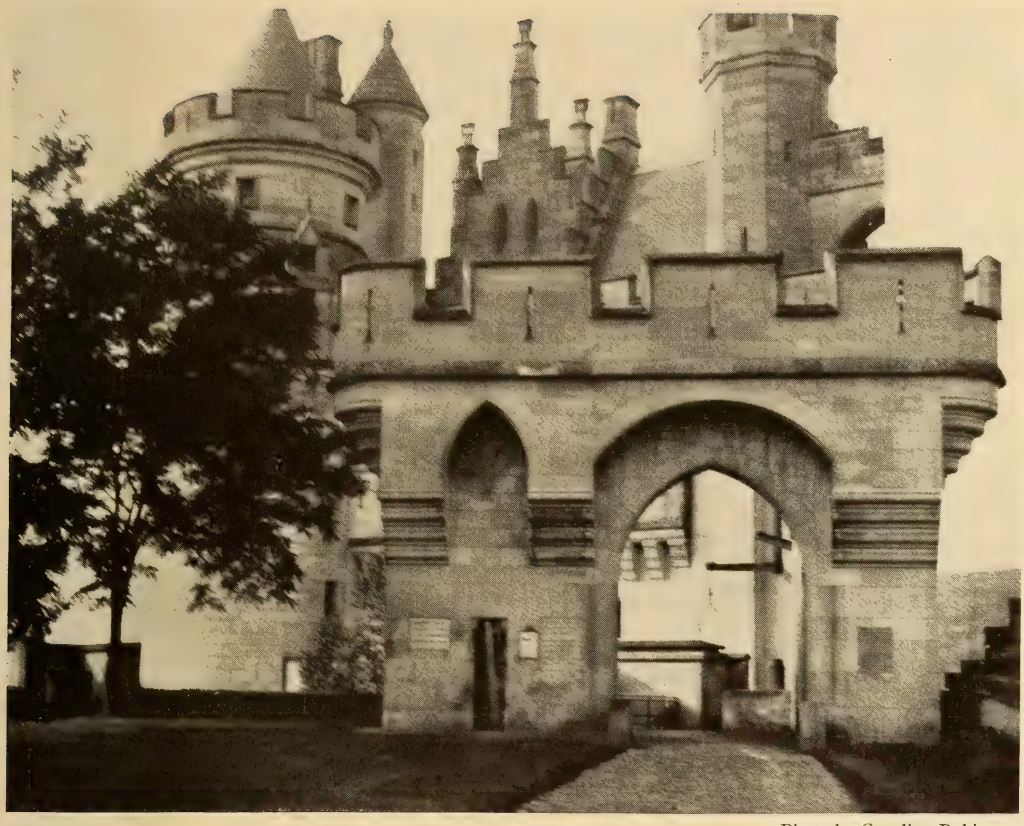


Photo by Caroline Robinson

ONE OF THE GATES OF THE CHATEAU PIERREFONDS (SEE PRECEDING PAGE)

titles of nobility were abolished. Every trapping and every custom that savored of monarchy disappeared. Every one, rich and poor, high and low, distinguished and unknown, was addressed as citizen. The king himself became "Citizen Capet" and the bootblack in the street became "citizen bootblack." The day after the republic was proclaimed the National Assembly called upon all nations to rise against despotism, and pledged the aid of France to any people wishing to secure freedom.

The proclamation of the republic was followed by the trial and execution of the king, whose death awakened the bitter enmity of all the rulers of Europe, and brought about a grand coalition to crush the republican movement. Armies aggregating more than a quarter of a million of men threatened France at once on every side.

Now came another period in which the extremists, having banished royalty, turned on their late aids, the conservatives, and the Reign of Terror began. One cannot contemplate, without a shudder, the scenes of that terrible era, even at the distance of a century and a quarter. Supreme power was vested in the so-called Committee of Safety, and in the name of republicanism more crimes were committed than under the proscriptions of Sulla of Rome. All aristocrats and all persons who dared to feel otherwise than as the extremists felt were called to the guillotine, which labored overtime in its bloody task.

The churches were closed, their treasures confiscated, their bells molded into cannon, their holy images torn down, and the busts of their patriots set up. All emblems of hope were obliterated from the cemeteries, and above their gates came to be inscribed the words, "Death is eternal sleep."

For months the awful orgy of crime went on. It seemed that the maelstrom

NOTRE DAME CATHEDRAL FROM THE SOUTHWEST: PARIS

"And as for Paris, who does not know her beauties?—the beautiful quays by the smooth-flowing river, the magnificent bridges, the towering sublimity of Notre Dame" (see text, p. 487).

of human passion would shake civilization until not one stone of its foundation was left upon another. In Paris, benches were arranged around the scaffold of the guillotine and rented to spectators, like seats in a theater, and women came out with their knitting to watch, unappalled, the swiftly changing scenes of the horrid drama. A special sewer had to be constructed to carry off the blood of the victims.

At last there arose one who, on the floor of the assembly, dared denounce Robespierre as a tyrant. That denunciation broke the spell. Robespierre was forced to take a dose of his own medicine, and the people greeted his fall with demonstrations of unbounded joy. France's horrible nightmare was over. She had awakened from her ghastly dreams.

Awakened, she looked for a hand that could control and direct the wonderful force that grew out of the Revolution. That hand was found, and it was Napoleon's.

THE CODE NAPOLEON

Napoleon's career sounds more like a tale of romance out of the East than a true story out of the West. So transcendental was his genius that a clever curate, writing a skit on skepticism, declared that the Emperor was non-existent, since no man in human history had been able to accomplish the things attributed to Napoleon. Some one has beautifully said of him that he was "an auto-

crat in the name of democracy; a man of war in the interests of peace. The tragedy of his death, however, did more for the cause he inspired than the triumphs of his life; for long after the glories of the Bourbon dynasty have passed into oblivion the shades of the great captain will still haunt the soul of France, whose heart he has stamped with his own character."

It is a long story that one might tell of the military strength of the French people under the leadership of Napoleon, and of his wonderful victories and his great defeats. But if he left behind him a trail of blood and carnage, he also bequeathed to his race the Code Napoleon, in which the doctrines of the laws of human relations set up by the French Revolution were restated, redirected, and secured for all times. This Code swept away the iniquities of absolutism, recognized the equality in the eyes of the law of noble and peasant, and sent out into the world the invading forces of the ideas of liberty, equality, and fraternity, for which France suffered so much and to which the world owes so much.

If the history of France before Waterloo was a strange combination of wars and warring policies, internal and external, since Waterloo we have seen many remarkable gravitations of the pendulum of the sentiment from one form of government to another.

The accession of Charles X to the French throne, after the death of Louis XVIII, who had succeeded Napoleon Bonaparte upon his second abdication, brought there a reactionary policy of the deepest type. It was Charles X who made it said, through his blind and stubborn course, that "a Bourbon learns nothing and forgets nothing."

THE REASON FRANCE DREADS A POPULAR HERO

From that day forward, until after the Franco-Prussian War, France gravitated between monarchy and republic, as the pendulum between the two ends of its arc. But through it all the people continued to struggle for their rights, and inspired the masses of all the monarchies of Europe by their example. The constitutions of so many of the surrounding States underwent great changes in keeping with that of France that it came to be declared that during the month of March, 1848, not a single day passed without a constitution being granted somewhere.

Although a generation has now passed since the last monarchy flourished, under the Third Napoleon in France, the French people are eternally watchful lest a monarchy should rise again. Recalling how Napoleon III was elected dictator by a vote of 12 to 1, the French people live out that doctrine of the American people, "Eternal vigilance is the price of liberty."

America has no fear of a dictatorship or the rise of a monarchical rule, for republicanism has such a deep-seated hold upon our people that the doctrine is as solid in their hearts as the eternal hills. But France understands that only less than half a century has passed since the last monarchy, and that therefore she must be watchful lest the coup which turned the Third Napoleon from a Prince President into an Emperor should be practiced again. For this reason the brilliant, dashing, popular hero, likely to be possessed of an ambition to wear the cloak of a Cæsar, is invariably rejected in favor of men like Loubet, Fallières, and Joffre, who, descended from good peasant stock, have no other wish than to carry out their duties with simple and unostentatious devotion.

FRENCH LITERATURE

While it is impossible to overestimate the debt that the world owes to France for the suffering and sorrow she has borne in behalf of the cause of human liberty, her other contributions to civilization have not been less notable. The world, indeed, owes much of its literary tenets and tendencies of the twentieth century to France.

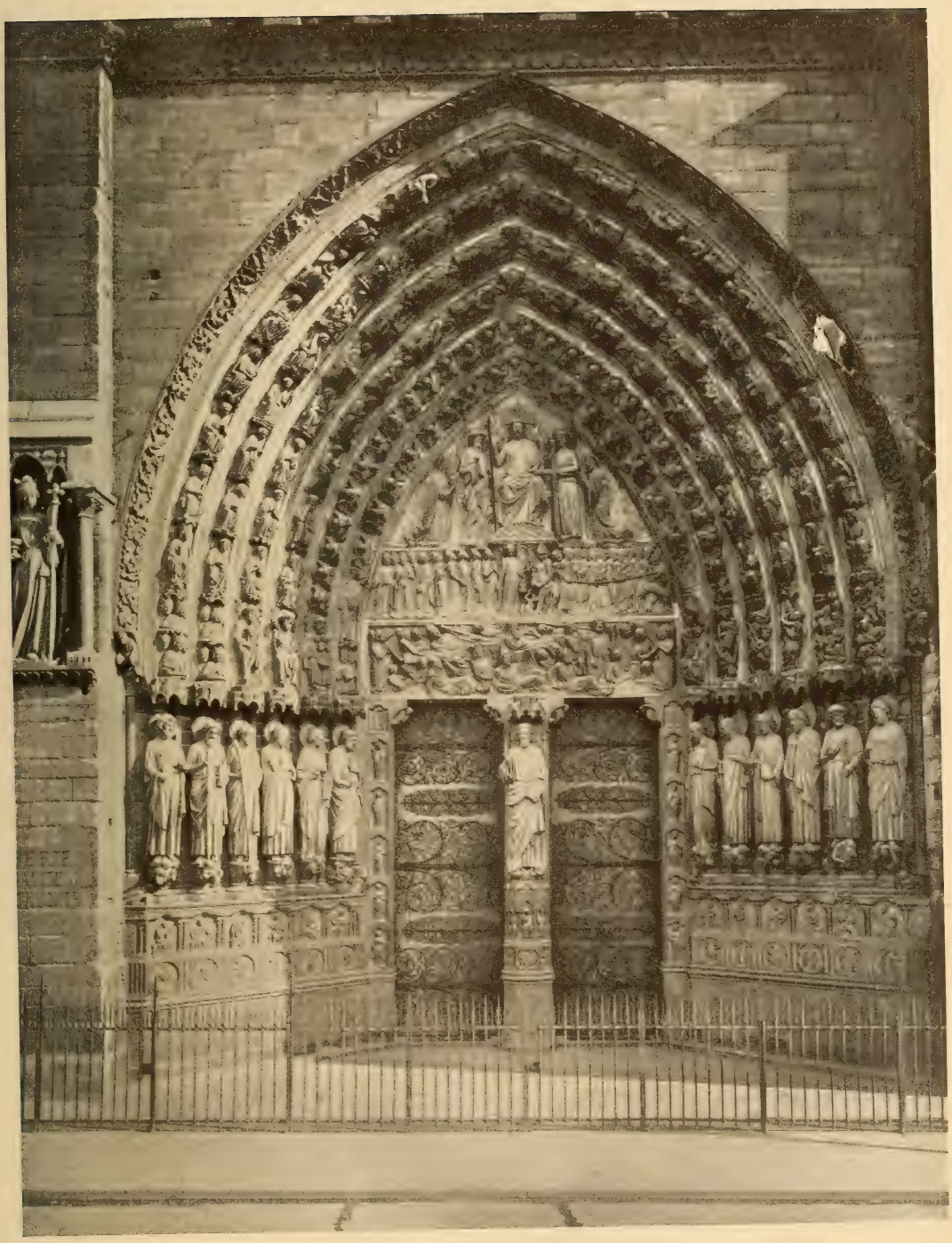
The roll of great French writers is a long one and their contributions to literature very rich. Corneille, Molière, Rabelais, Diderot, Descartes, Chateaubriand, Voltaire, Rousseau, Victor Hugo, the Balzacs, and Alexander Dumas are names that will live as long as polite society and republican government endure upon the earth.

"There is no really great epic in

Photo by Emil P. Albrecht

NOTRE DAME: PARIS

Le Strynge, the vampire, the most popular of the many chimera perched upon the balustrade surrounding the towers. He looks across Paris with utterly disdainful eyes and mocking tongue, while the night-bird beside him shrieks to the heavens who knows what insults.



THE PRINCIPAL PORTAL OF NOTRE DAME: PARIS

The portals of Notre Dame abound in rich sculptures, most of them being replacements of those destroyed during the Revolution and the Commune. Those of the central portal portray the Last Judgment, with Christ the chief figure.

Photo and copyright by Underwood & Underwood

THIS BEAUTIFUL AND HISTORIC CITY IS NOW IN RUINS: ARRAS, FRANCE

Few cities of history have ever suffered more terrific bombardments than Arras during the past year. The wonderful façade of the City Hall, shown in the center of the picture, is now destroyed, the Cathedral is but an unsymmetrical pile of stones, and the railway station a tangled skeleton of steel framework.

French, few great tragedies, and those imperfect and in a faulty kind, little prose like Milton's or like Jeremy Taylor's, little verse (though more than is generally thought) like Shelley's or like Spenser's. But there are the most delightful short tales, both in prose and in verse, that the world has ever seen, the most polished jewelry of reflection that has ever been wrought, songs of incomparable grace, comedies that must make men laugh as long as they are laughing animals, and above all such a body of narrative fiction, old and new, prose and verse, as no other nation can show for art and for originality, for grace of workmanship in him who fashions, and for certainty of delight to him who reads."

OUR DEBT TO PASTEUR

Nor has France given more direction to the literary aspirations of mankind than she has to the scientific endeavors of humanity. Go back to the beginnings of science and you will see her astronomers pointing the way that astronomy has pursued. It was her Pasteur who established the germ theory of disease and through whom the wonderful miracles of saving human life that have characterized the past third of a century have been wrought. The normal death rate of civilized countries before the days of Pasteur was about 30 per thousand of population. Today it is about 15 per thousand in the more progressive nations.

Think what the saving of 15 lives a year for every thousand of population means when applied to half the earth! It means the averting of 12,000,000 untimely deaths annually. It means more than 25,000,000 cases of illness avoided. It means health and happiness in 20,000,000 homes rather than disease and distress. Who can estimate the benefits to humanity of the wonderful discovery of Pasteur? When one tries to comprehend the far-reaching results already attained and to estimate those that may yet flow out of that basic discovery, one's mind is simply unable to grasp it all.

Certain it is that the life-saving processes reared on the great foundation built by Pasteur are saving more people from beds of sickness and untimely graves than the great war in Europe, with all its terrors, is able to send there.

THE SCIENCE OF RADIO-ACTIVITY

And then we must not forget that radium comes to the world through the French laboratory, and with it the budding science of radio-activity. Who can say what the world's debt to France therefor is going to be? Those who know most about it tell us that we stand with reference to extracting power from the rocks exactly where our forefathers long ages ago stood when they saw the lightning flash set fire to the dead pine tree, but stood ignorant and helpless to reproduce the fire. We know that there are thousands of times as much power wrapped up in radio-active material as there is in coal, thanks to the work of the French laboratories; and when we learn how to harness that power as we have harnessed the power of wood and coal, by promoting the processes of decay, as it seems that we are destined to do, who can adequately portray the possibilities that would follow?

And while we think of this wonderful new science, whose book France has opened to the world, we must not forget its elder sister, the science of electricity, which, while harnessed to man's purposes mainly by American inventors, had the foundations upon which they built laid largely in France.

And so it has been in all things. France has dared to break new ground, to invade new fields of research, to risk a thousand defeats in the hope of ultimate victory. She has been enough of a conservative to hold fast to all that was good from the past and yet progressive enough to let go of all that is not worth while and to reach out for whatever promises to add even a jot or a tittle to human progress. She has not permitted herself to be handicapped by a too-deep reverence for the past nor yet by a restraining fear of the future. She lets nothing stand before her duty to her ideals; and her ideals are bound up in the good of all time—past, present, and future.

Photo and copyright by Donald McLeish

MEMBERS OF THE CITIZEN ARMY OF SWITZERLAND

The Swiss army is the most democratic in the world. There are no officers but those who have served as privates

THE CITIZEN ARMY OF SWITZERLAND

NOWHERE else in the world has the art of self-defense better adjusted itself to geographical conditions than in the little Republic of Switzerland. While the subject of national preparedness holds such a large place in the minds of the American people, it becomes of value to study the remarkable system the Swiss people have evolved — a system fitted to national ideals which do not accept the doctrines of militarism on the one hand, and which reject the doctrines of peace at any price on the other. The Swiss system is particularly interesting to Americans because of the kindred theories of government in Switzerland and the United States, the similar aspirations of their people, and the close relationship of their needs.

Although they have democratic tendencies perhaps stronger than our own, although they believe in local self-government perhaps more thoroughly than we do, and although they possess a very deep conviction that central authority must not encroach upon the rights of the cantons, the people of Switzerland have made themselves a nation under arms, yet a nation without the slightest thought of adding a foot to its territory or of disturbing that peace whose blessings it loves and appreciates.

There is nothing in Switzerland corresponding to a regular army. One might hunt for months around the country without finding one man whose profession is military; yet almost as hard would it be to discover one able-bodied citizen who has not had some soldier training.

QUICK MOBILIZATION

While Switzerland has a population smaller than that of Massachusetts, with an area twice as large, it can mobilize 240,000 men in 24 hours. On the same basis, the United States could put 8,000,000 men into the field, though of course it would take longer to get them to central points of mobilization. Behind a field army of 240,000 the Swiss have a reserve of equal proportions. The United States could, under the Swiss system, have a trained army of citizens reaching a grand total of 16,000,000 men of all arms. Under that standard we would have 160 trained men from every town of 1,000 population; while a county of 30,000 inhabitants could thus send 2,400 men to the front and hold as many more in reserve.

There is no soldiery in the military world costing as little per man as the Swiss.

This difference arises from the fact that the army of the Swiss Confederation is in truth a citizen army. It is organized on what has been called the "voluntary compulsory" system, to which the Swiss people have freely resigned themselves in order to guarantee the independence of their country. They were the first people of Europe to introduce universal liability to military service.

UNIVERSAL SERVICE

Universal compulsory military service in Switzerland dates from 1874, when the old system of requiring each canton to raise an allotment of three men for every hundred men of its population was done away with, and the system of requiring every able-bodied man to meet for training was substituted. The new system worked with very little trouble or friction from the beginning, and the Swiss people are very proud of their citizen army.

In its fundamentals the idea of the citizen soldier laid down by the men who framed the Constitution of the United States is the same as that followed in the organization of the Swiss army. The Swiss do in practice what we do in theory. Every able-bodied man in America is supposed to be a member of the militia, and yet how few have ever shouldered a gun or marched in company formation!

The Swiss boy, at the age of ten, is put into the gymnastic class at school, and begins learning the elements of the soldier drill on the school-house playground. Long before he is old enough to be called upon for service he has learned to do the manual exercises and to go through much

Photo by Arthur A. Porchet

A SWISS SOLDIER ON SENTRY DUTY ON THE GRAND ST. BERNARD

of the drill that afterward fits him for a soldier.

When a boy reaches 17 years he is liable to service—a liability which continues until he is 50 years of age. Even after that he may be liable, if he is capable of doing any other army work than soldiering, such as acting as baker, veterinary surgeon, or otherwise.

FEW PROFESSIONAL SOLDIERS

Yet with all of this universal training, the only people in Switzerland who make arms an exclusive profession are the Commander - in - Chief, selected by the Federal Assembly, and the General Staff. These form the brains of the army. The rank and file belong to the cantons, just as the militia do to the States in this country.

The Swiss man sacrifices cheerfully a definite amount of his time to preserve his independence as a citizen of a free country.

Entrenched behind its native rocks, the citizen army of Switzerland contains every element of the nation. The man of wealth and the peasant are found shoulder to shoulder. No man is compelled to spend the crucial years of his life away from home in the army, and yet every man is required to contribute his share to that army's maintenance and the nation's safety.

At the age of 20 every able-bodied Swiss youth becomes a member of the "Auszug," and every one who lacks the necessary qualifications regrets that he is unable to coöperate with other young defenders of his country. During the first year of liability he must serve 75 days or more, and 11 days for each successive year he is called to the standard. It is no excuse that he has brothers already in the army, or that he has a widowed mother dependent upon him. The burden of preparedness, spread over a nation, becomes no onerous task for any

Photo by Arthur A. Porchet

SWISS SOLDIERS ON SKEES ON THEIR WAY TO THE HOSPICE, WHICH CAN BE SEEN IN THE DISTANCE

one, and the average young man in Switzerland looks upon his time spent in training camps as a pleasurable vacation, profitable to the safety of his country.

Service in the "Auszug," or "Elite," continues until the citizen reaches the age of 32. Thereafter he passes into what is known as the "Landwehr," or First Reserve, where he remains until he has completed his 44th year. He must give in that time nine days of service during each four years that he belongs to the "Landwehr." After he has passed 44 he goes into the "Landsturm," or Second Reserve, where he stays until he is 50, and even beyond that if national necessity calls him.

At the various stages in his career proper exemptions become the lot of the soldier. Those in the employ of the State, railway and steamboat men, hospital officials, and others reach their exemption early; preachers, doctors, prison officials, postal and telegraphic officials are exempt; but the man who has to go into the field has the consolation that the man who may stay at home also has his burden to bear, for, in addition to all other taxes, he must pay a special military poll tax of $1.20, a military property tax of 15 cents per $100 (with property under $200 exempted), and a military income tax of 1½ per cent. The total tax thus paid by any one person cannot exceed $600. The assessments are rigorously made and every penny exacted.

NO CRACK REGIMENTS

Rich and poor serve side by side in the Swiss army, and there is none of the "crack" regiment idea to be found. Neither is there any picking and choosing in the service; each man is placed where he can serve best. There is only one general, and he is picked from a nation of soldiers; nor is his remuneration lordly, for his salary is only $10 a day.

The caste system has not been permitted

Photo by Arthur A. Porchet

A COMPANY OF SWISS SOLDIERS BEING WELCOMED BY THE MONKS ON THEIR ARRIVAL AT THE HOSPICE

to creep into the Swiss army, for the very essence of the Swiss military idea is that all men start from the scratch, and that brain and ability must win the race.

The line troops of the Swiss army are raised like our State militia. The cantons of Switzerland correspond to the States of the United States, and each canton keeps its own troops and selects their officers. These officers are nominated by the Grand Council of the canton, upon the recommendation of the cantonal military director, after having successfully passed through the schools of instruction. Promotion from second to first lieutenant takes place according to seniority, but thereafter merit is the determining factor. No officer rises to a higher rank than colonel, for there is only one general in the Swiss army, and he is the Commander-in-Chief.

The engineers, guides, sanitary and administrative troops, and the army train are enrolled by the Confederation. Arms also are supplied by the Confederation. The cantons furnish equipment and uniforms, but are reimbursed therefor afterward by the federal authorities.

LITTLE INDOOR DRILL

The process of training the Swiss militia is exactly the reverse, both in theory and fact, of the process of handling the American militia. The Swiss seek the fields in their training, while in our militia service the recruit's first enthusiasms are, as a prominent American officer has observed, dissipated in the grind of barrack-yard drill, where no man need to, and no man is expected to, use his head.

If any one thinks that the Swiss army would win an international cup in a dress-parade affair he is mistaken. Its regiments might not receive any great applause were they in Washington marching up Pennsylvania avenue in an inaugural parade. Unmilitary onlookers might conclude that it was a very "punk" military organization. But the trained

soldier, able to separate at a glance the essentials from the non-essentials, would see in those regiments men who had received excellent training in field work, and in whose instruction nothing was omitted that would make them, when marching to their country's defense, dependable and trustworthy troops. Combined with their training, they possess a sparkling patriotism and a deep courage, inherited from ancestors who had no fear of death. These qualities, united with a love of country unsurpassed in any known people, are such that no nation would enter into a conflict with them lightly; for, being a nation in arms, preferring annihilation to defeat, they are bound to compel universal respect.

A RESOURCEFUL SOLDIER

The daily life of the Swiss citizen inures him to hardship and fatigue; the high educational standards of his country give him perhaps a higher average of intelligence than any rank and file in Europe; generations of battling with the mountains have made him ingenious and resourceful, and he combines the dash of the Frenchman with the stolid courage of the Briton. If to these qualities you add the fact that as a marcher he is tireless, as a marksman he is without a peer, all that is left for the severest military critic to desire are the few tricks of the parade ground, which any drill sergeant readily can teach him.

The Swiss government does everything in its power to stimulate the interest of the boys in marksmanship, although not long ago it was forced to enact a law against too much military parading by irresponsible gatherings of youngsters. During a recent year there were nearly 13,000 boys, between the ages of eleven and twenty years, engaged in shooting practice in Switzerland. Their shooting clubs take the place of our baseball teams, and the sand-lot enthusiast of America sees no brighter visions of his becoming a Walter Johnson or a Ty Cobb of one of the big leagues than the boy of Switzerland sees of his succeeding to the marksmanship championship of his country.

Reckoning according to population, if we had as many boys under twenty years of age practicing marksmanship as Switzerland, we would have approximately 400,000.

MAINTAINING TARGET PRACTICE

Every commune in Switzerland is required by federal law to maintain, at public expense, a safe and suitable target range of not less than 1,000 feet. All legally organized shooting clubs of the commune have a right to use this range without expense. The government gives 80 cents a year to each club for each member doing a prescribed amount of shooting during the year. The annual number of shots fired in target practice in the army and in the shooting clubs reaches nearly 30,000,000 rounds, two-thirds of which practice is done by the shooting clubs.

Any shooting club, having not less than ten members, which complies with the conditions set forth in the law, may claim the State subsidy. This subsidy is paid to the club instead of the individual, being determined in amount by executive decision each year when the year's firing program is announced. Only the army rifle and army ammunition are recognized by this law. The military authorities of each canton appoint a shooting committee of from three to seven members, who supervise the arrangement and the firing of the various squads in this canton. The president at least must be an officer of the active army.

Between the shooting matches of the communes, the cantons, and the Confederation, Switzerland is able to keep her rifle shooting up to an unprecedented standard of excellence. On fête days one may see men in all the different grades of the service, from the newly joined recruit to the major of his battalion, standing side by side in the shooting-club contests. Every Swiss soldier is compelled to fire at least 35 rounds annually. If he does not complete his score at the cantonal rifle meetings, he is obliged to attend a three-days' course of shooting under military supervision.

While the Swiss militiaman gets nothing for his services, on the other hand he is absolved from all expenses. When

Photo by Wehrli

THE TELL MEMORIAL: ALTDORF, SWITZERLAND

The historians will never agree as to whether William Tell ever lived in flesh and blood; but that he lives today in the spirit of Swiss love of freedom the whole world recognizes

Photo by Wehrli

LAUTERBRUNNEN AND THE SPRAY BROOK, SWITZERLAND

The road in the foreground is typical of the magnificent highways which enable the Swiss to maneuver their troops to the greatest possible advantage, and which should be an object lesson to American highway builders.

going up for drill, his uniform is a railroad pass, and while he acts as a soldier he need not put his hand in his pocket to draw out money for any necessary expense. He is entitled to no pension; but if, in the course of his military duty, he has become incapacitated, so that he is unable to earn his livelihood in an ordinary calling, the State will respond with such assistance as may be reasonable. Moreover, the same consideration is extended to his widow and family should he be killed in the course of duty to his country.

In war times or during maneuvers every citizen is expected to provide food and lodging for such soldiers as his dwelling and means permit him to shelter. Should he prefer not to have soldiers billeted at his house, he is obliged to pay into the army treasury a sum sufficient to provide lodging for them elsewhere. Every householder in Switzerland is informed of the number of men and horses he is expected to receive, and when the annual maneuvers are held in his district he makes preparations accordingly. By this system the army train is made comparatively light, and the mobility of the force is greatly increased as a result; for it is only on rare occasions that the troops go under canvas, being billeted, whenever possible, with the inhabitants of near-by towns.

Though surrounded on all sides by belligerent millions, whose interests might be served by asking her to step out of their path, Switzerland today stands an island of peace in a sea of war, because she has been prepared to maintain her neutrality and her freedom, or at least to exact such a price for them that none of the nations at war can afford to pay for their violation.

Photo by Arthur A. Porchet

SWISS MOBILIZATION: THE CALL FOR BREAKFAST

"Though surrounded on all sides by belligerent millions, whose interests might be served by asking her to step out of their path, Switzerland today stands an island of peace in a sea of war, because she has been prepared to maintain her neutrality and her freedom, or at least to exact such a price for them that none of the nations at war can afford to pay for their violation" (see text, page 509).

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THE NATIONAL GEOGRAPHIC MAGAZINE

JERUSALEM'S LOCUST PLAGUE

Being a Description of the Recent Locust Influx into Palestine, and Comparing Same with Ancient Locust Invasions as Narrated in the Old World's History Book, the Bible

By John D. Whiting

Author of "From Jerusalem to Aleppo" and "Village Life in the Holy Land," in the National Geographic Magazine

HEAR ye this, ye elders, and give ear, all ye inhabitants of the land,—hath this ever happened in your days? or in the days of your fathers? Concerning it to your children tell ye the story,—and your children to their children, and their children to the generation following:—That which was left by the creeping locust hath the swarming locust eaten, and that which was left by the swarming locust hath the grass locust eaten; and that which was left by the grass locust hath the corn locust eaten. Awake . . . and weep and howl . . . For a nation hath come up over my land, bold and without number" (Joel 1:2-6).*

Thus Joel, writing some seven or eight hundred years B. C., begins his description of a locust plague, which then as now must have laid waste this land. We marvel how this ancient writer could have given so graphic and true a description of a devastation caused by locusts in so condensed a form.

*From the Emphasised Bible, critically translated by Rotherham.

FORMER LOCUST INVASIONS

One often finds among the old peasant men those who are gifted with telling stories, whether true or imaginary, and thus, as in Joel's days, history is still handed down to the children, children's children, and another generation. The oldest men have thus been recounting the stories of havoc caused by flying locusts fifty years ago that used to sound like "Arabian Nights" tales. Still there is no doubt that the present visitation eclipses any in the memory of the present generation, and probably equals in severity any former one.

Since 1865, so commonly called "sent el jarad" (year of the locusts), locusts have at intervals reappeared in Syria, but in smaller areas and causing nothing like a general disaster or distress, the more recent of these having occurred in 1892, in the Jordan Valley near Jericho, where waving fields of tall green barley and wheat were eaten down to the very stump in a remarkably short time. In 1899 they were found in small quantities in Galilee,

Photo by American Colony Photographers, Jerusalem

THE FIRST APPEARANCE OF THE LOCUSTS

"Attention was drawn to them by the sudden darkening of the bright sunshine, and then by a veritable shower of their excretions, which fell thick and fast and resembled those of mice, especially noticeable on the white macadam roads. At times their elevation was in the hundreds of feet; at other times they came down quite low, detached members alighting" (see text, page 513).

and in 1904 in the southern desert, also visiting Egypt.

The present influx covered all of Palestine and Syria—that is, from the borders of Egypt to the Taurus Mountains.

ADULT FLIERS FIRST APPEAR

It was one of the last days of February, 1915, that Mr. Lewis Larson, to whose skill and energy we are indebted for the superb collection of locust pictures appearing on these pages, returned from the picturesque Ain Fara gorge, which borders on the Wilderness of Judea and is only a few miles east of Jerusalem, with word that swarms of locusts had flown overhead in such thick clouds as to obscure the sun for the time being.

However, before they were seen, a loud noise, produced by the flapping of myriads of locust wings, was heard, described as resembling the distant rumble of waves, or, as St. John has it, "the sound of their wings was as the sound of chariots of many horses running into battle" (Rev. 9:9),* the picture on page 512 vividly portraying Joel's word picture

> "A day of cloud and thick darkness,
> As dusk spread over the mountains—
> A people many and bold" (Joel 2:2).*

Immediately rumors poured in from the Christian towns of Es Salt, on the uplands east of the Jordan, and Bethlehem, that similar swarms had also visited them, causing much destruction.

In Jerusalem the first were seen one Monday of the first days of March, at noon. Attention was drawn to them by the sudden darkening of the bright sunshine, and then by a veritable shower of their excretions, which fell thick and fast and resembled those of mice, especially noticeable on the white macadam roads. At times their elevation was in the hundreds of feet; at other times they came down quite low, detached members alighting. The clouds of them would be so dense as to appear quite black, with the edges vignetted till they thinned down and faded away into the clear blue sky around.

For several days Jerusalem was thus visited. Predictions were rampant as to the terrible results which would accrue, but now we can see that not even the worst pictured the actual ravages as severe as we now see them. They did not settle in Jerusalem, evidently seeking greener and less populated districts; so that after the first few days nothing more was seen of these adults here, while at Bethlehem they were brought to the earth by heavy showers of the late rains.

Quantities were now gathered by the poorer Bethlehemites. A few ate them roasted, describing the taste as delicious, especially the females full of eggs. Still the main reason for collecting them was in order to secure the small bonus offered by the local government of Bethlehem. Thus tons were destroyed, being buried alive till several ancient abandoned cisterns were filled, while in surrounding villages each family was required to produce a stipulated weight. Likewise in Jaffa they were destroyed by being thrown into the Mediterranean and, when washed ashore dead and dried on the beach, were collected and used as fuel in the public "Turkish baths" and ovens.

FROM WHENCE COME THE LOCUSTS?

These clouds of flying locusts, in Jerusalem at least, invariably came from the northeast going toward the southwest, and it was observed that when strong winds arose, too stiff for them to resist, rather than be carried they seemed to settle till the storm passed over.

Students of Joel, who assert that the first two chapters up to the 28th verse picture an actual invasion of locusts and not Judah's human enemies, as the Assyrians and Chaldeans, find a difficulty in the verse, "And the northerner will I remove far from you," since locusts were reported to invade Palestine from the south; the present experience not only removes this difficulty but establishes the accuracy of Joel's account.*

As to the exact region from which they migrated to visit Palestine, it is now difficult to say, especially in view of the disorganization of mails and news channels caused by the present cruel European war.

* The Emphasised Bible, Rotherham.

* Cambridge Bible, Driver, Joel, and Amos, page 28.

Photo by American Colony Photographers, Jerusalem

NATURAL ENEMIES OF LOCUSTS

"Large flocks of storks flew past Jerusalem during the early days when the adults arrived and after the larvæ were hatched, consuming abnormal quantities, for which reason the natives have always given 'Abo Saad' a warm welcome" (see text, page 521)

THE WALLS OF JERUSALEM

"During the Egyptian plagues we find Moses announcing the locust scourge in terms of which our present experience is such an exact duplicate, as follows: 'Behold tomorrow will I bring the locusts into thy coasts: and they shall cover the face of the earth . . . and they shall eat the residue of that which is escaped . . . every green tree which groweth. . . . And they shall fill thy houses, and the houses of thy servants, and the houses of all the Egyptians'" (Ex. 10:4-6) (see text, page 533).

With these adult locusts, the *Acridium peregrinum,* more commonly termed *Schistocerca peregrina,* the males and females are readily distinguished, for, like most creatures, human beings excepted, the males are by far the handsomer. Both are about 2½ inches long, the female being slightly larger. The wings are semi-transparent and filled with veins, or, more correctly, strengthening tissues, and are white with brown spots. The male has a vivid yellow body, while that of the female is a deep brown.

LAYING THE EGGS AND DYING

At once these numberless hosts began to prepare for the destruction that was to follow. Each female, now loaded with eggs, seeks a place suitable to deposit them, and with her ovipositors is able to sink a hole as much as 4 inches deep, through hard compact soil, such as would try the strength of human muscles even with iron tools (see also page 521). How so small and frail a creature can bore in such hard ground and to such a depth seems a marvel which only nature can accomplish or explain. While boring the hole the female sits, wings outstretched, upon the earth, and possibly moistens the soil to facilitate the work. She evidently has the ability to stretch or lengthen her *annulea,* pressing her body into the hole till the depth required is attained.

The eggs, averaging about a hundred in number, are now deposited in the bottom of this hole, not haphazard, but neatly arranged in a long cylindrical mass and enveloped in a sticky glutinous secretion, with which frothy substance the top of the hole is also sealed to prevent enemies encroaching, and at the same time of such a nature as to allow the newly hatched brood to get out readily. It was found, in digging for these eggs, that when newly laid they could with ease be removed from the soil in one piece over an inch long and as thick as a slate pencil; but once a few days had passed, they crumbled apart when touched.

The eggs require a certain amount of moisture, for once dried or exposed to air they never hatch, which no doubt accounts for the depth to which the mother parent at times deposits them into the ground.

Once the female locust has laid the eggs, her life mission is done; she flies away—where to one cannot say—and soon dies.

One remarkable feature is the variety of soils and climatic conditions under which these eggs were laid. In the Jordan Valley, earth's lowest spot, 1,300 feet below the Mediterranean, we find them deposited on the very banks of this historic river, notably at "the Ford," where it is supposed the Children of Israel passed over into Canaan (Josh. 3); also farther down toward the Dead Sea, in soil heavily impregnated with alkali, where are the "slime pits" into which probably, during their retreat, the kings of Sodom and Gomorrah fell when in full flight from Chedorlaomer and his allies (Gen. 14).

Then they were to be found on the highest mountain tops; in the beautiful olive groves about Bethlehem and Zelzah, birthplaces of David and Saul, Israel's first kings; also in the vicinity about the fields and village of the Shepherds, where, eighteen hundred years ago, mortal ears heard an angel chorus; in the chalky soil of Wad el Nar (Valley of Fire), which is the extension of the Vale of Hinnom, a place where Israel caused "his son or his daughter to pass through the fire to Molech" (2 Kings 23: 10).

They were deposited in the barren districts of the wilderness of the "scape goat" (Lev. 16: 7-26), as well as in the richest soil of the Philistine Plain, where Samson turned loose the 300 foxes with firebrands into his enemies' wheat fields (Judges 15: 4, 5); also in the soft, moving sand-dunes along the seacoast of Tyre, Sidon, Askelon, and Gaza, cities once ranking with the greatest of the earth; among the world-famed Jaffa orange orchards; in the rocky and rugged valley between Mickmash and Gibeah, on whose precipitous sides "Jonathan climbed up on his hands and his feet" into the Philistine garrison and slew a score of them (1 Sam. 14: 4-14). In fact, in all parts of the country so laden with historic events, whether in open fields or standing grain, in the plain or in

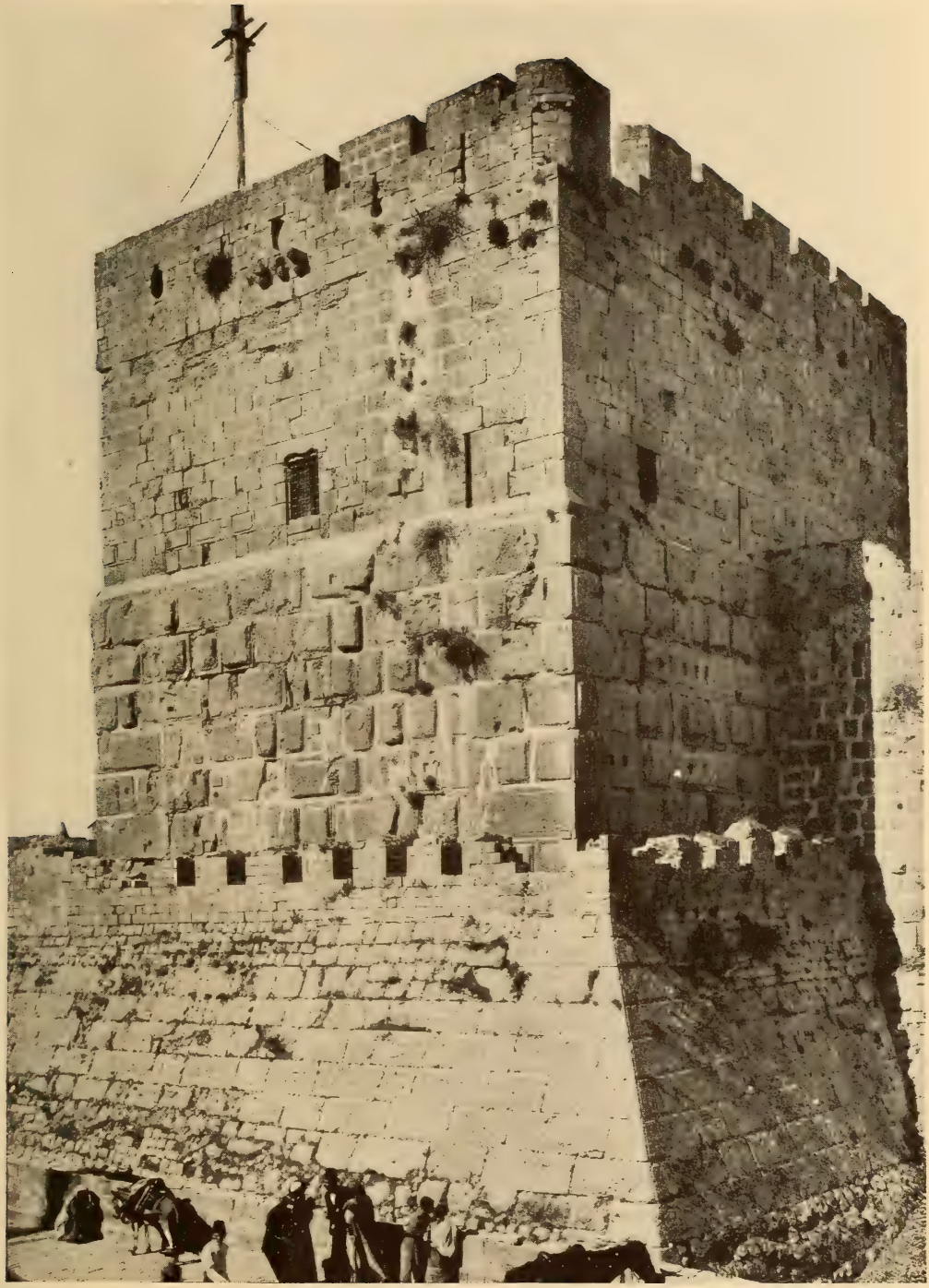


Photo by American Colony Photographers, Jerusalem

THE TOWER OF DAVID

"Did not Joel then see the already ancient walls of Jerusalem in his day, as we do now, form so slender an obstacle to tiny soldiers composing immense armies, causing him to so graphically exclaim: 'They shall run like mighty men; they shall climb *the wall* like men of war; and they shall march every one on his ways, and they shall not break their ranks!'" (Joel 2:7) (see text, page 526).

Photo by David Fairchild

A YOUNG LOCUST IN THE LARVA STAGE, BEFORE IT HAS ANY SIGNS OF WINGS (SEE TEXT, PAGE 543)

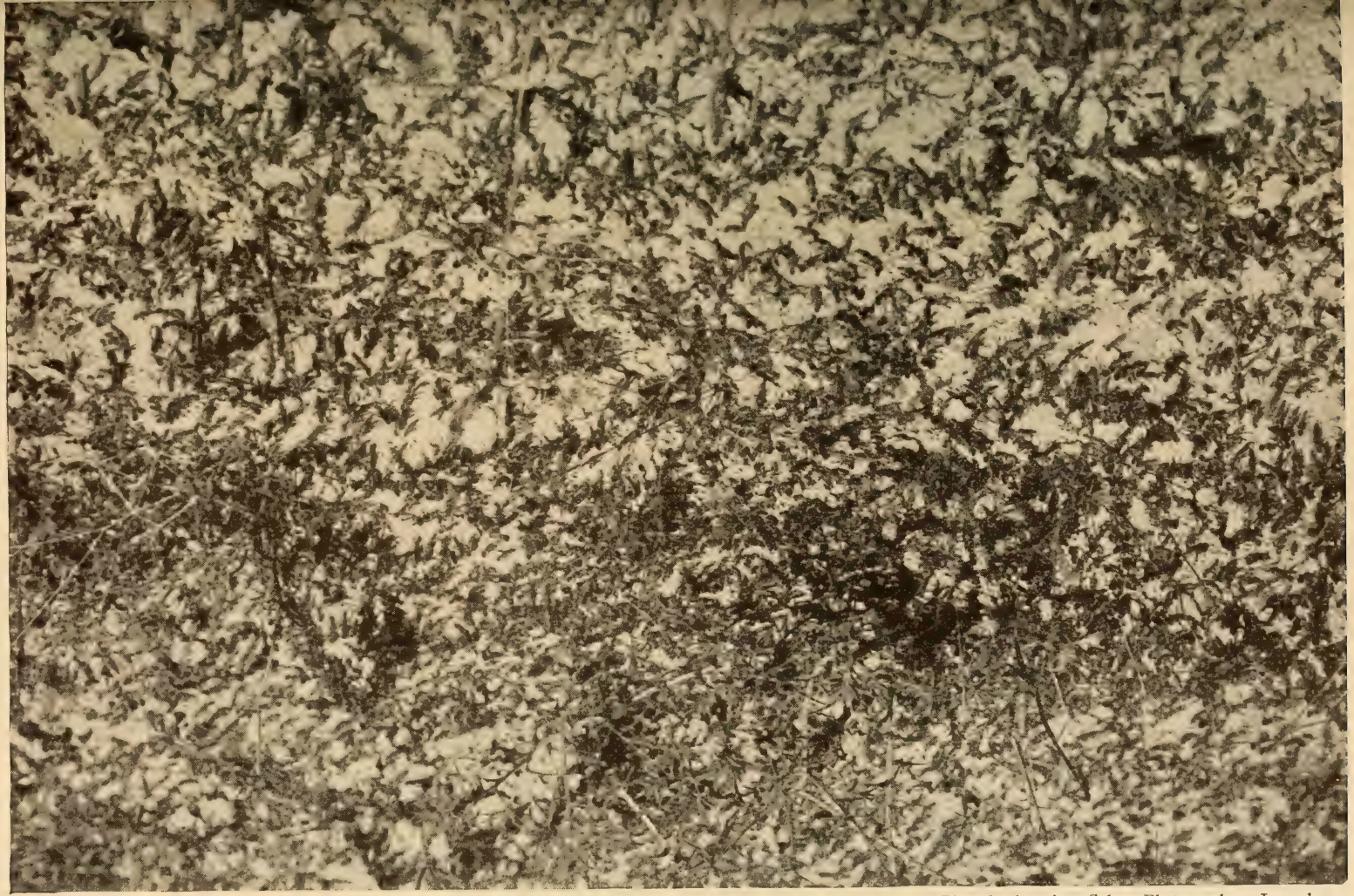


Photo by American Colony Photographers, Jerusalem

THE LOCUST LARVA AS FIRST SEEN NEAR JERUSALEM (SEE PRECEDING ILLUSTRATION)

"No wonder, then, that the writer of the book of Judges likens the hordes of the Midianites, who for years devastated Israel's land, to locusts, and 'as the sand which is upon the sea-shore for multitude'" (Judges 7: 12) (see text, page 522)

Photo by American Colony Photographers, Jerusalem

A VINEYARD STRIPPED BY LOCUSTS OF ALL ITS LEAVES

"Once entering a 'vineyard,' the sprawling vines would in the shortest time be nothing but bare bark, the long, dark stems lying flat on the ground much resembling snakes" (see text, page 529). Note how even some of the shoots have been barked, leaving them snow-white.

the sterile and rocky mountains, whether it be damp grounds or those absolutely parched and dry, there seemed to be little difference.

While going to the Samaritan Passover we* observed in the valleys we passed between Bethel and Mount Gerizim swarms of the adult locusts flying about. At Zahtara the entire mountain side, a rocky slope facing south, with sparse wheat patches between the boulders, was simply covered with locusts preparatory to laying eggs. On the homeward trip the next day they were still there, and while climbing a short-cut on foot we each trod to death several hundreds, so thick were they. Five days later, returning for the ceremony on the last day of the Passover, not a trace of one was to be found.

COLLECTING THE LOCUST EGGS

Once the alarming extent to which these eggs were laid was realized, the authorities issued a proclamation, dated April 19, requiring each male person from 16 years to 60 to gather eleven pounds of the eggs.

To be among the first to set a good example, the young men of the American colony at once began the work of collecting; for so steeped are the natives in fatalism (Allah has sent the "jarad" and they are helpless to fight them) that, unless forced or shown how to, few would turn a finger over in self-defense. The fields chosen for our work were those last mentioned about "Gabah" (Gibeah), now a poor village, possibly the very Gibeah whose inhabitants were once the cause of the first Israelitish civil war, in which the tribe of Benjamin all but perished (Judges 20).

As we started out, loaded with small knapsacks of food and blankets, and armed with small picks, the clouds gathered and the winds blew. It was so late in the year that hard rains had not been anticipated; but when the party got to Ain Farah, where headquarters were to be established with "Abid el Waleh," a character few who have been to Ain Farah do not know, sleeping outdoors had to be abandoned because of the downpour.

Seemingly the only alternative was to accept the host's hospitality in his sheepfold, a large natural cave with but a small opening, of which the precipitous cliffs here are full. Such were the "sheep-cotes," by the way, at Engedi, in which the pursuing King Saul lay asleep at the mercy of his fugitive David, who even now refrained from killing his lifelong enemy, but, instead, only "cut off the skirt of Saul's robe" (1 Samuel 24).

But not relishing the enjoyment of passing the night in a flea-infested cave, the like of which kings in the past had not despised, Yankee ingenuity constructed instead a small roof out of a few sheets of corrugated iron, which were Abid el Waleh's share of booty from a recent pillage, and although the rain beat down relentlessly, it afforded some little protection. After two such nights and rainy days the party returned home with but a handful of eggs; but, better still, with fields for future egg hunting well located.

The storm once over, a little tent afforded protection for the second campaign. Most of the locust eggs we discovered were in uncultivated fields of the hardest dark-red soil, covered with a thin sod. A small patch would be found only a few meters in extent literally honeycombed and filled with the eggs; then for a space no more would be found till a new spot was located. A warm, sunny place with a southern exposure seemed to be the rule.

It is estimated by competent authorities that as many as 65,000 to 75,000 locust eggs are concentrated in a square meter of soil, and allowing for a loss of 30 per cent in hatching, some 60,000 destroyers can emerge from a space 39 inches square (see also page 516).

NATURAL ENEMIES OF LOCUSTS

Locusts are not, however, without their own enemies provided by nature. Large flocks of storks flew past Jerusalem during the early days when the adults arrived and after the larvæ were hatched, consuming abnormal quantities, for which

*The party mentioned were the three responsible for the present article—Mr. Lewis Larson, photographer; Mr. Lars Lind, and the author.

reason the natives have always given "Abo Saad"* a warm welcome (see page 514).

While collecting these eggs many of the cells were found to contain eggs laid by certain species of flies, probably the *Ida lumata* Fabr. and the *Anthomya cana* Macq., the young worm or larva of which, when hatched, lives upon the locust eggs, sucking them dry, till developed into the chrysalis and emerging a full-fledged fly. Wild birds and domestic fowls developed a ravenous appetite for locusts, while with the smaller larvæ and pupæ turkeys and chickens simply gorged themselves, with the result that the yolk of their eggs became a deep-red color.

At breakfast one morning Allie brought on a most gorgeously tinted omelet, when little Spafford, fixing his astonished eyes on it and hearing that the chickens feeding on locusts were responsible for the change in color, broke out with "Mama, if we hatched those eggs, would locusts come out with the chicks?"

But while countless numbers thus fall prey to the appetites of tiny worms or these larger birds, it is said that the locust is its own worst enemy, as later we shall see (pages 544 and 547).

A TRICK IN EVERY TRADE

Of late the city natives have revived an old dish called "ishareyeh," a sort of macaroni rolled by hand from dough into small particles which exactly resemble locust eggs. While many forms of evading the law were sought, one of the trickiest ways was by a certain Jerusalemite who, not wishing to exert himself in collecting the locust eggs, shirked the burden in true Oriental style onto his wife. She, procuring some white clay, rolled it like "ishareyeh" into forms so like the locust eggs that, when presented to the officer in charge, they readily passed for the genuine article. She, of course, could not keep the secret; it was too good to keep, and that is how it is now known.

THE CREEPERS REACH JERUSALEM

Scarcely had Jerusalem gotten over the excitement of the search for eggs, scarcely had they relapsed into a sense of something like safety from disaster as a result of those efforts, than word poured in that first the lowlands, or Plain of Sharon, and then the hill country to the west of the city, were teeming with the young larvæ.

At Jerusalem proper no eggs had been laid, as above noted, the nearest fields being in the Valley of the Roses, out of which the railroad emerges on approaching Jerusalem. From here, then, and from the Bethlehem district came the forces to attack the "Holy City."

When first hatched they were quite black and resembled large ants, having no signs of wings; but as they developed, passing through one stage and into another, they cast their little outer skins, now no longer large enough to contain the growing body. Thus they pass through several moults, of which, however, but three stages are plainly distinguishable—the larva or wingless stage (see page 518), the pupa, with small wings, or properly wing sacks developing (see pages 536 and 543), and the full-fledged flying locust (see page 538).

Once hatched the little fellows seemed to hold together for a few days, till a little developed and in sufficient numbers, when they would start their forward march of from 400 to 600 feet per day, clearing the ground of any vegetation before them.

It was observed that these new broods instinctively went in the reverse direction to that from which their flying parents had come, making practically for the northeast. None but those who have seen them can begin to imagine their countless multitudes and the destruction to follow. No wonder, then, that the writer of the book of Judges likens the hordes of the Midianites, who had for years devastated Israel's land, to locusts, and to "the sand which is upon the sea-shore for multitude" (Judges 7:12) (see page 519). "For they (Midian) came up with their cattle and their tents; they came in as locusts for multitude; both they and their camels were without number: and they came into the land to destroy it" (Judges 6:5).

*Abo Saad (Father of Good Luck), the Arabic name for the stork.

Photo by American Colony Photographers, Jerusalem

A FRESHLY ATTACKED FIG TREE

In an inconceivably short time every leaf is consumed, leaving bare and barked twigs only

Photo by American Colony Photographers, Jerusalem

A FIG TREE JUST BEFORE THE LOCUSTS ATTACKED IT (COMPARE WITH NEXT PHOTO)

LOCUSTS CAUSE SEASICKNESS

One evening it was heard that the locusts had already reached the German colony and the railroad station, and as we went out the next day to see them, scarcely had our carriage swung around from the Jaffa Gate than we found the white road was already black with them. Ever in the same direction they pushed up the "Western Hill," still commonly called Zion, even entering the houses about the "Tomb of David." The roads now became so slippery from the masses of the little, greasy bodies crushed beneath the horses' hoofs that the horses could scarcely keep a footing and had consequently to be driven slowly and with great care. Afterward it was heard

Photo by American Colony Photographers, Jerusalem

A FIG TREE JUST AFTER THE LOCUSTS ATTACKED IT (COMPARE WITH PRECEDING PHOTO) (SEE TEXT BELOW)

that likewise trains throughout the country had been stopped for hours at a time, notably on the Damascus-Haifa line near the Lake of Galilee.

Below the Lower Pool of Gihon old olive trees, yesterday green, were now nothing but bare trunks and twigs, and further up the valley a couple of beautiful mulberry trees had just been attacked, the leaves falling like rain, and already the ground was deeply strewn with them, and long before evening they, too, were leafless. This, however, proved to be but a sample of coming things.

The locusts, when advanced into the second or pupa stage, walk like ordinary insects, leaping only when frightened into a quicker pace, which they readily accomplish by the use of their two long and powerful posterior legs. However, while still in the first or larva stage, they seemed to hop much like fleas, so that when anything neared their thickened masses it seemed as if the entire surface of the ground moved, producing a most curious effect upon one's vision and causing dizziness, which in some was so severe as to produce a sensation not unlike seasickness. The same was also true when watching them undisturbed on tree or field.

SCALING THE TOWER OF DAVID

One of our most interesting experiences, while noting the locusts' methodical but stubborn moves, occurred when they first reached Jerusalem. Countless numbers of the young locusts poured into the broad, walled road leading into the city from the west, past the United States Consulate to the Jaffa Gate. For three or four days an incessant and unending stream filled the road from side to side, like numberless troops marching on parade, and in spite of the traffic at this junction, which to this city is like lower Broadway to New York, their ranks, although thinned, entered the ancient gateway and the New Breach. "Though in among the weapons they fall they shall not stop" (Joel 2:2).*

* The Emphasised Bible, Rotherham.

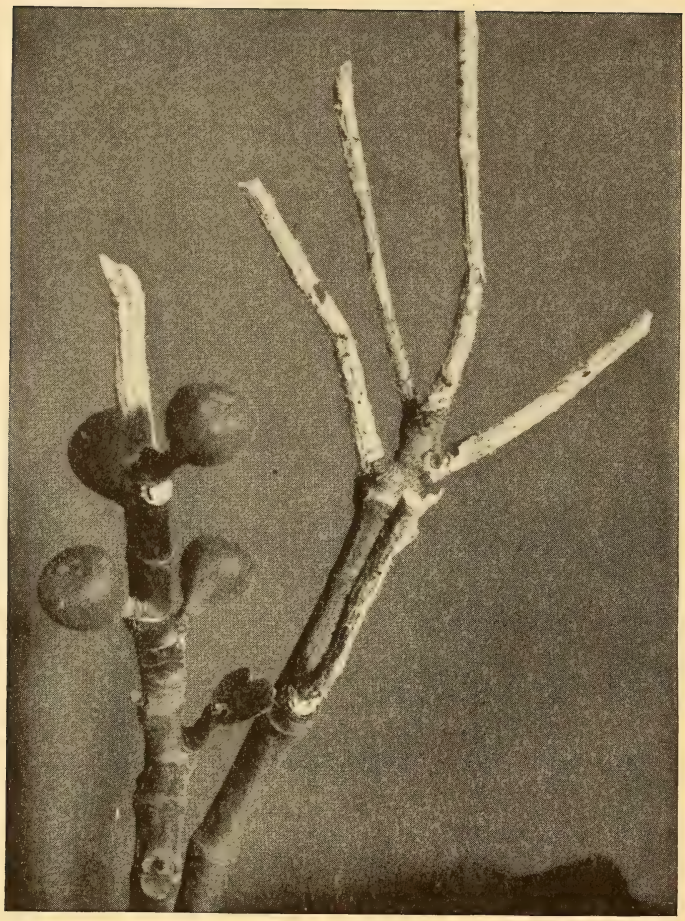


Photo by American Colony Photographers, Jerusalem

"He hath . . . barked my fig tree; he hath made it clean bare. . . . The branches thereof are made white" (Joel 1:7). This photograph was taken about two weeks after the locusts had destroyed the tree (see text, page 529).

Thus the moat around "David's Tower" was so filled that the dry earth seemed to be a living mass. Up and up the city walls and the castle they climbed to their very heights.

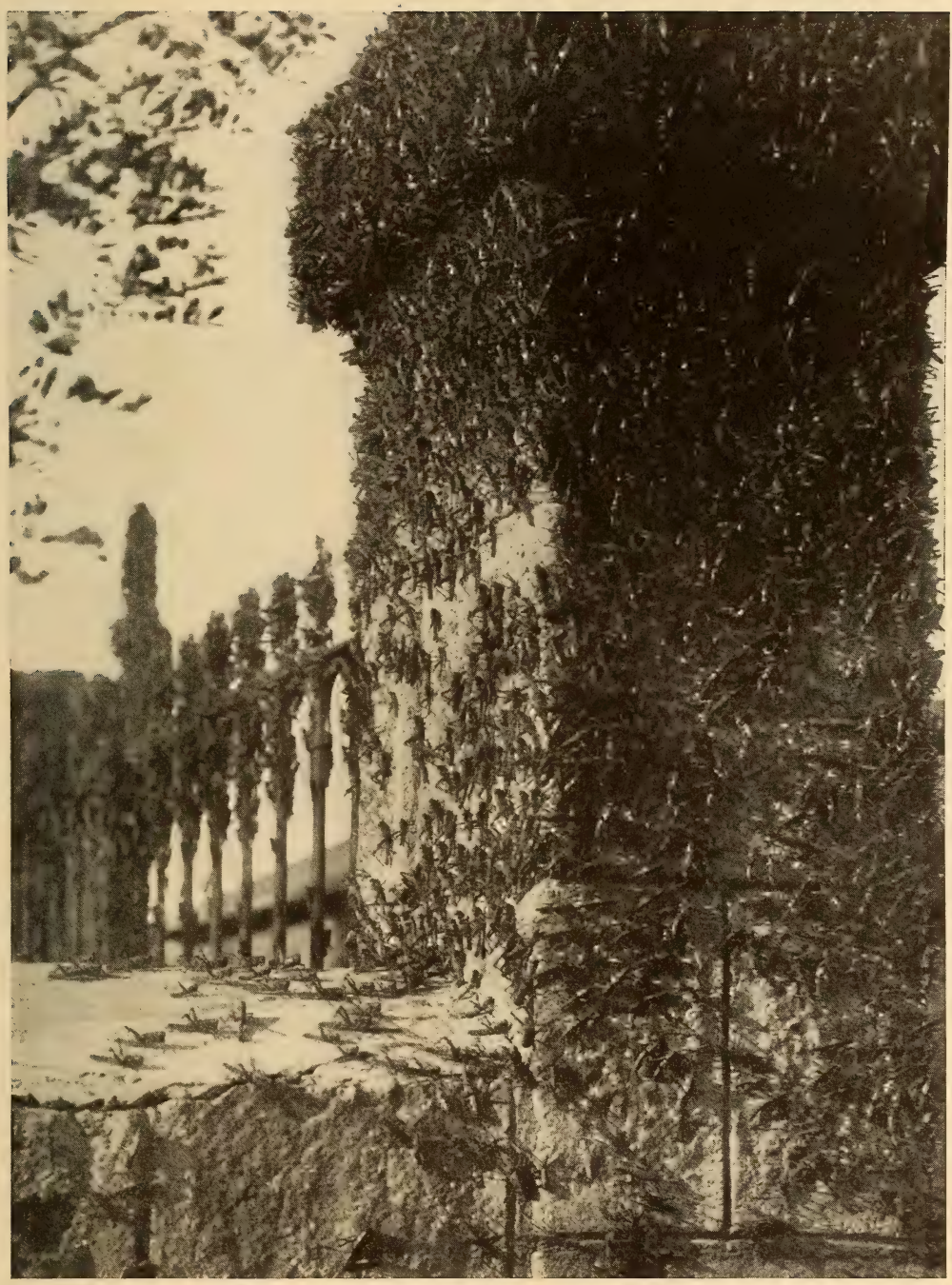
The origin of this tower, as all will infer, has been attributed to King David ever since the Middle Ages, and while it may not be the very "Castle of Zion," the foundations, and especially the site as a natural defense, must have dated back many centuries, if not to the days when Jerusalem was created an Israelitish city from the older Jebus, wrested from the Jebusites by David. The castle now affords a fine example of the ancient style of fortifications (see page 517).

Did not Joel then see the already ancient walls of Jerusalem in his day, as we now do, form so slender an obstacle to tiny soldiers composing immense armies, causing him to so graphically exclaim: "They shall run like mighty men; they shall climb *the wall* like men of war; and they shall march every one on his ways, and they shall not break their ranks"? (Joel 2:7). What should have impelled them thus, against odds, to make for the old walled town; for, as all who have been here know, "Jerusalem is built as a city that is compact together" (Psalm 122:3), affording nothing in the way of forage for them? Seemingly it can only be explained by their instinct leading them in a definite direction.

After a few days' effort, however, they reversed their course, and for several days streams of them made for the opposite direction, but only far enough to escape the barrier which the city afforded; and, this once attained, they swung around into the very direction heretofore pursued.

Again, what could have instructed them thus to escape the difficulty? Solomon, the first naturalist, if we may thus call him, says of them: "The locust hath no king, yet go they forth all of them by bands" (Prov. 30:27).

At the consulate the fight was taken up to save the garden. It lay, as we have seen, in the main path of the locusts. The inclosure, about the size of an ordinary American city lot, required five men to keep incessantly brushing the locusts down from the walls on the three sides attacked. At the southern end, so persistent were they that but a few seconds



THE ATTACKING HOSTS

"Disastrous as they were in the country, equally obnoxious they became about the homes, crawling up thick upon the walls" (see text, page 533)

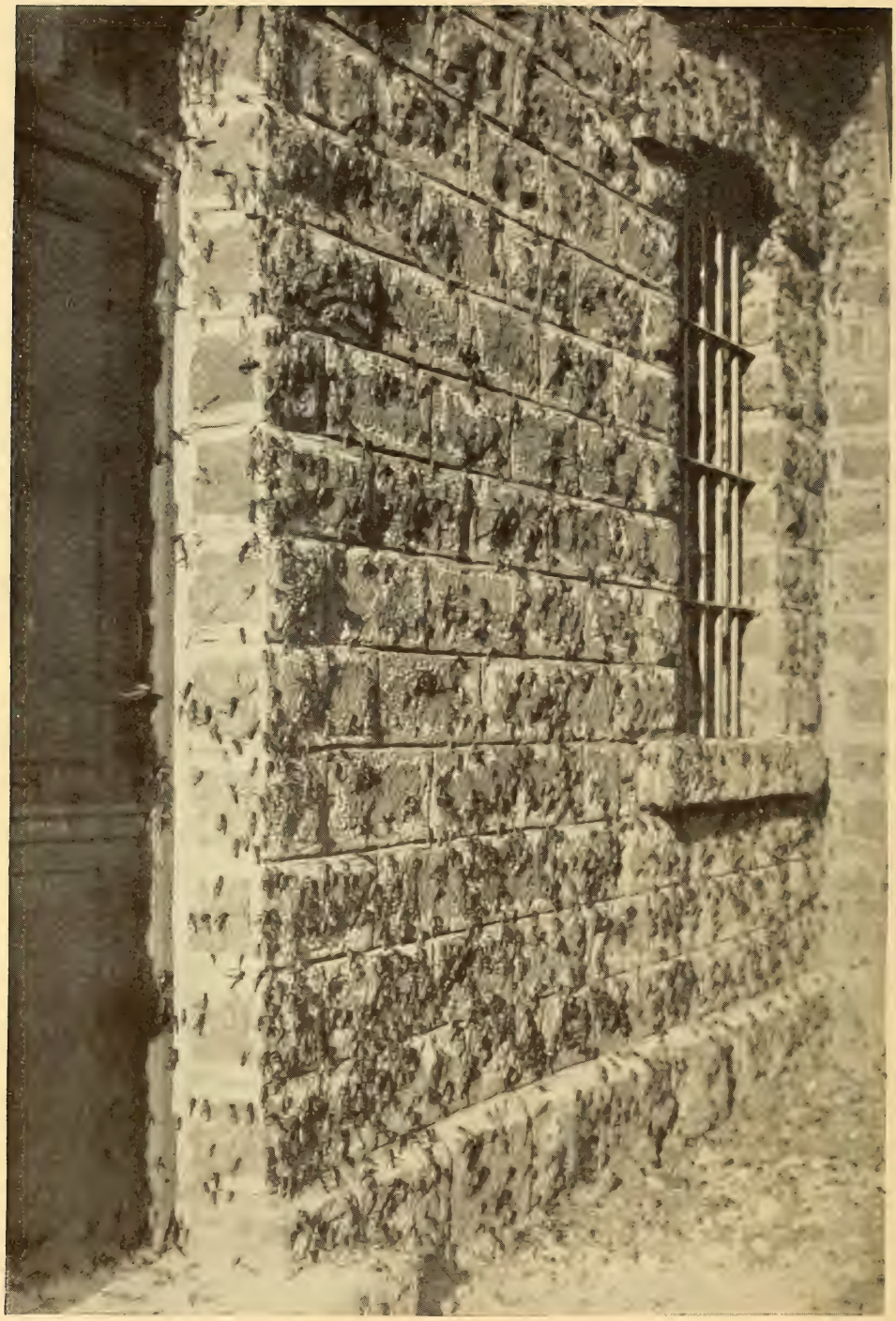


Photo by Dr. P. Mühlens

"AND THEY SHALL FILL THY HOUSES, AND THE HOUSES OF THY SERVANTS, AND THE HOUSES OF ALL THE EGYPTIANS"

Thus during the Egyptian plagues we find Moses announcing the locust scourge in terms of which our recent experience was such an exact duplicate (Exodus 10:4-6) (see text, page 533).

after being cleaned the wall would again become a living mass.

It was the 28th of May when the larvæ, already passing into the pupa stage, reached the quiet of Gethsemane, now in its full summer bloom; but scarcely had a day passed before every tender thing was consumed, and even the leaves of the woody cypress and of the olive trees, the latter about 1,000 years old, were threatened. "The land is as the garden of Eden before them, and behind them a desolate wilderness; yea, and nothing shall escape them" (Joel 2:3).

But now, after passing up this narrow defile between the city and Olivet, and to the west of the city, making through the more sparsely built new Jerusalem, they at last reached the northern suburbs; so that the entire town, with the exception, as before noted, of the portion within the walls, fell a prey to their ravages. We shall now try to depict what was here seen and befell the entire land from "Dan to Beer-sheba"* (see map, p. 542).

VINES AND FIG TREES FIRST ATTACKED

Fortunately by the time these young broods had hatched the grain crops were too far advanced to be much hurt. The reaper had already thrust in his sickle. But alas for the fruits and summer crops!

The native vineyards and orchards are always planted here in perfect confusion. Between the vines one finds figs, olives, pomegranates, quinces, and other trees. These were the places at which the locusts naturally halted, for the rapidity of their marches and the frequency of their stops seemed to be regulated by the amount of forage encountered.

Once entering a "vineyard," the sprawling vines would in the shortest time be nothing but bare bark, the long dark stems lying flat on the ground, much resembling snakes (see page 520). Fig leaves perhaps of all things best suited their taste, and when once a tree fell a prey to them the ground about would be literally layers deep, and the trunk so covered with crawlers as to make it a bright yellow color. On every leaf dozens would be perched (see page 523). They first ate away the tender parts, leaving a perfect skeleton of the large broad leaves. But soon these, too, were devoured, and usually after one day's work the tree stood naked of any leaves, with nothing but the hard unripe fruit protruding stiffly from the branches (see page 525).

When the daintier morsels were gone the bark was eaten off the young topmost branches, which, after exposure to the sun, bleached snow-white. Then, seemingly out of malice, they would gnaw off small limbs, perhaps to get at the pith within. The effect thus caused was a weird one, resembling white candles on a dried-up Christmas tree (see illustration on page 526).

"He hath laid my vine waste, and barked my fig tree: he hath made it clean bare, and cast it away;* the branches thereof are made white" (Joel 1:7).

In the same manner all fruit and many shade trees were deprived of all that made them attractive and useful. The quinces (probably the "apple" of the Bible) were stripped of leaves, and, like the figs, the fruit was left on to wither, harden, and fall off, while the pitted fruits, like the apricots, had the meat of the fruit consumed and the seed left still adhering mockingly to the tree; so that, in but a few days, Jerusalem, although never too verdant in summer, presented a sad and desolate aspect. But worse was yet to come.

FRUIT AND VEGETABLE MARKETS EMPTY

The vegetable and fruit seasons were just setting in as the young brood was hatching. Even to one looking over the local desolation the vastness of the destruction could not be realized. One day David's Street markets were full of fresh vegetables at the usual low prices. The commoner apricots from Ramleh† made their first appearance that day and were not seen again. The better ones from near Bethlehem likewise only on that day made their appearance, and it was not

*An expression taking in all of the land once belonging to the Hebrews (1 Kings 4:25).

*"And cast it away," no doubt referring to the clipping off the twigs.

† The second station on the railroad up from Jaffa, supposed to be the home of Joseph of Arimathæa, who claimed Jesus' body and laid it in his new tomb.

Photo by American Colony Photographers, Jerusalem

AMERICANS FIGHTING LOCUSTS

"In the path of the locusts was sunk a bottomless box, the inside lined with shining tin, up which the locusts could not crawl, while on each side a wing was provided, similarly prepared with a smooth metal face, with the object of directing them into the box. The fighters made two long lines, one on each side of the trap. . . . A large flag, the darker the better . . . proved to be the most formidable tool one could employ to make them move in the desired direction" (see text, page 535). Note the thickened masses driven together and just entering the trap. The locusts at this stage of their development cannot fly.

Photo by American Colony Photographers, Jerusalem

A LOCUST TRAP

"As long as they came in these endless chains, with but a little guiding, their ranks could be narrowed and practically driven from morning to night into the sunken box" (see preceding picture and text on page 535).

Photo by American Colony Photographers, Jerusalem

A LOCUST MOULTING AND HIDING PLACE (SEE PAGE 543)

The Prophet Nahum, allegorically speaking of Judah's enemies, likens them to the moulting locusts thus: "Make thyself numerous as the swarming locust. . . . The grass locust hath stripped itself and flown away! . . . Which settle in the hedges on a cold day. The sun hath broken forth and they are in flight" (Nahum 3: 17. The Emphasised Bible, Rotherham). We have before noted how the locusts hide from the cold in loose stone walls. The Hebrew word here rendered, "hedge," is *"gedarah,"* identically the same as the present Arabic name for these rubble walls, as shown in the picture.

difficult to perceive that they had been prematurely and hurriedly plucked to save them.

But these are but drops in the bucket. Miles and miles of water- and musk-melon fields fell a prey to the locusts on the plains. Likewise were destroyed the cucumber, vegetable marrow and tomato fields, and the truck gardens in plain and hill, to say nothing of the absolute annihilation of the grape and fig crops. Thousands of acres of dura, or native corn, still but a few inches tall, were eaten to the ground.

In fact, nothing escaped their ravages except the orange gardens at Jaffa, due to the heavy sea breezes and strenuous human efforts, while those of the suburbs were entirely eaten. The only vegetables now entering the Jerusalem markets came from Jericho. Here the eggs laid in the alkali fields seemed not to hatch, while those near the Jordan were thoroughly dug out; so that not a single wingless locust was seen there, and the crops remained undisturbed, till suddenly enveloped by the new fliers, as we shall see later (see page 544). The only vegetables and fruits now available came from the Jaffa gardens, but instead of being, as usual, the food for the poor, they were so rare that none but the richest could pay the price at which they sold.

INVADING THE HOMES

Disastrous as they were in the country, equally obnoxious they became about the homes, crawling up thick upon the walls and, squeezing in through cracks of closed doors or windows, entering the very dwelling rooms (see page 528). When unable to find an entrance they often scaled the walls to the roofs, and then got into the houses by throwing themselves into the open courts, such as most Oriental houses are built around. Women frantically swept the walls and roofs of their homes, but to no avail.

In Nazareth it required several hundred men to sweep the locusts together and to destroy them, and many donkeys to carry away to near-by fields the miniature carcasses. Stores were closed and some houses abandoned, for there it seemed as if the locusts were even more active than in other towns.

During the Egyptian plagues we find Moses announcing the locust scourge in terms of which our present experience is such an exact duplicate, as follows: "Behold tomorrow will I bring the locusts into thy coasts: and they shall cover the face of the earth, . . . and they shall eat the residue of that which is escaped . . . every green tree which groweth. . . . And they shall fill thy houses, and the houses of thy servants, and the houses of all the Egyptians" (Ex. 10:4-6).

About our houses they became so thick that one could not help crushing them with every step. They even fell into one's shirt collar from the walls above and crawled up onto one's person. Women were especially troubled with them, and on one occasion a lady, after being away from home for half a day, returned with 110 of them concealed within the skirts.

Whenever touched, or especially when finding themselves caught within one's clothes, they exuded from their mouth a dark fluid, an irritant to the skin and soiling the garments in a most disgusting manner. Imagine the feeling (we speak from experience) with a dozen or two such creatures over an inch long, with sawlike legs and rough bodies, making a race-course of your back!

One warm, breathless night they were found crawling thick into our windows, which were left open after sundown, for usually during the cool nights they never moved. "They shall run to and fro in the city; they shall run upon the wall; they shall climb up upon the houses; they shall enter in at the windows like a thief" (Joel 2:9).

A FELLAH PESSIMIST

One evening of the first days of June, while fighting the locusts on Scopus, the mountain adjoining Olivet to the north, and the very ground on which Titus' Roman army pitched camp in 70 A. D., when Jerusalem was entirely destroyed (Mark 13:2), an aged fellah walked up, and notwithstanding the wholesale capture befalling the locusts, broke out with: "All this is no use; go home and rest; you can do nothing. They are Allah's army, and once they fly they will destroy everything. So it was 'sent el jarad'

Photo by American Colony Photographers, Jerusalem

AN OLIVE ORCHARD JUST AFTER THE LOCUST INVASION

The natives all spoke of how the orchards looked as if they had been attacked by fire, calling to mind Joel's words, "The flame hath burned all the trees of the field" (Joel 1 : 19) (see text, page 543)

(year of the locusts) when I was young. In four minutes they left all the olive trees as wood."

He walked away seemingly amused at our optimism, while we smiled, not knowing from experience, as he did, the truth of his apparent exaggerations.

ALLAH'S ARMIES

It is interesting to note that the natives all speak of them as "Jaish Allah" (God's army), they even finding the word "askar" (soldier) written in the Arabic characters upon the wings of the invading locusts. In the same way they were looked upon by the Hebrews of old. Thus: "The Lord shall utter his voice before his army: for his camp is very great" (Joel 2:11).

From the "Hadith," or books containing the collected oral sayings of Mohammed, with explanations, we translate the following: "Do not kill the locusts because they are the host of God the Most Mighty." It was so said (thus it is explained) provided they did not attempt to spoil the grain fields (that is, of the Mohammedans). For (so the story runs) a locust fell between the two hands of the Apostle (Mohammed), and it was written on its two wings in Hebrew: "We are the host of God the Most Mighty, and we have ninety-nine eggs, and had the hundredth remained to us we should have eaten the world with all that is in it." Therefore the "Apostle" said: "Our God, destroy the locust; kill its great ones and cause to die its little ones, and corrupt its eggs, and close their mouths against the plantings of the Mohammedans and their places of getting a living."

FIGHTING THE LOCUSTS

A few words of our personal experience fighting locusts may not be amiss.

At first the locusts, already having marched a considerable distance from the place of hatching, were found in endless columns "as a strong people set in battle array" (Joel 2:5). It was now easy to entrap them. In their path was sunk a bottomless box, the inside lined with shining tin, up which the locusts could not crawl, while on each side a wing was provided, similarly prepared with a smooth metal face, with the object of directing them into the box.

The fighters now made two long lines, one on each side of the trap. To noise and racket the locusts seemed only to turn a deaf ear; but a large flag—the darker the better—with which to cast a deep shadow upon the ground, proved to be the most formidable tool one could employ to make them move in the desired direction; in fact, countless numbers could thus be guided and held in check if one but anticipated the general direction they wished to go (see page 530).

As long as they came in these endless chains, with but a little guiding their ranks could be narrowed and practically driven from morning to night into the sunken box (see page 531). Now and then the trap would have to be emptied; or if the place the trap was set was to be abandoned in favor of a better position, it was an easy matter when this bottomless box was almost full to raise it out of the ground, leaving the locusts behind in the hole, and then hurriedly bury the contents. It was found by actual test that when thus buried in great masses they quickly died, and in 24 hours would develop into a putrid mass.

As the evening advanced they became sluggish and hard to move, and would crawl under individual stones, such as the fields are full of, or into small piles of rock and the common rubble walls; but by the morning again instinct would have rejoined them into bands moving together on their plans of destruction.

However, toward the end of their pupa stage their columns became shorter and less constant. They seemed to form into smaller pillaging groups, with only the acquisition of food in view. Now it became more troublesome to trap them, as they had grown large and wary. Often, after anticipating their course and while sinking the trap into the hard and rocky soil, they would become alarmed and, turning tail, escape in all directions.

TRAPPING THE LOCUSTS

One evening while trapping them on the upper side of the hill we learned just in time that an immense number were just about to enter the property from the

Photo by American Colony Photographers, Jerusalem

THE LOCUST (PUPA) JUST BEFORE ITS FINAL MOULT AND TRANSFORMATION INTO THE FULL-GROWN FLYING INSECT

The large wings of its future state are fully developed and neatly folded up in the four membranous cases, resembling tiny wings (see text, pages 522 and 543)

opposite side. At once all efforts were turned in this direction, and the trap was sunk into the lower edge of the field toward which they were making; but no sooner had it been set in place than the locusts again changed their course. Notwithstanding the laborious task involved, the trap had to be moved, during which process it was nip and tuck to keep the locusts from escaping. Once, however, they made in the right direction, they jumped, hundreds at a time, into this death trap.

The evening hours were now upon us; the locusts, weary from being driven and benumbed from the cool breezes, seemed to near the trap exhausted, while those behind kept piling up till the earth for a small space was covered layers deep. To facilitate matters, with spade and rake they were scraped into the trap, now constantly being emptied.

Thus in about an hour's time four large sacks full were caught and destroyed, each containing no less than 100,000 of these insects. Many escaped and made for a near-by thorny patch, on which was now piled more dry sticks and thistles, which when set afire burned alive many thousands more. The above is but an average example showing how and in what quantities they were caught.

To overcome the difficulty of the labor and time required in shifting the sunken trap, Yankee ingenuity again came to the rescue. An old box, tin-lined, was set on top of the ground, with an inclined plane leading up to it. The locusts, which can make ascents so much easier than descents, were driven into it just as easily as into the sunken trap. It was so quickly and easily placed that it proved to be a great success, the only drawback, as with the older type, being the labor of emptying it and the numbers that unavoidably escaped. The next development was a tin hopper set on legs high enough to admit of fastening a sack below. To this the inclined plane was similarly attached. Thus the locusts jumped directly into the bag, which, when full, was readily detached and replaced with another, while the full sacks, not a locust of which could escape, were so handy to carry away for destruction.

After over two weeks' steady and re-

Photo by David Fairchild

THE SKELETON WHICH THE LOCUST SHOWN ON THE PRECEDING PAGE LEAVES BEHIND IT AFTER ITS FINAL MOULT

(SEE PAGES 522 AND 543)

Photo by American Colony Photographers, Jerusalem

DRYING THE WINGS

The locust now has its wings in their normal shape and is ready to try to fly. As the new flying locust casts its nymph skin the colors of its body are the most delicate hues, but after a couple of days of flying they deepen into a pronounced red effect.

lentless work, after faces were crimson and peeling and hands blackened from wind and sun, the fight to save the fields was given up and efforts concentrated upon protecting our homes and garden plots. Was it a losing fight? The aged fellah who predicted that it was useless to combat "Allah's army" surely would have said it was. From the standpoint of dollars and cents' worth saved to ourselves, it certainly was. But when we calculated the tons' weight and countless numbers of the pests eliminated from the coming stages of disaster, to say nothing of the value of a good example and the engrossing interest in observing their habits and development, we felt that the results more than outweighed the costs and efforts.

ESSA'S PARABLES

During the latter stages of the fight Essa had stayed at home protecting a garden from the locusts that by this time were encroaching upon the newer residential sections of Jerusalem. One evening Essa was found perched upon a rubble wall, two flags in hand, mechanically waving off the stubborn intruders. He looked as if he had an attack of something akin to St. Vitus' dance, for having been on the job for about two weeks his motions seemed automatic and almost without effort. Up to that time the locusts had tried to get into our garden only by the back wall, and at the time the writer was ignorant of their fresh efforts from other directions.

"Well, Essa, the Wrestler (for such is his nick-name), are you a gaining or losing wrestler?" Essa dropped his flags a moment as if to rest, stroked his shaggy beard and adjusted his clumsy headgear, and then added with a twinkle of his small, dark eyes:

"Master, a certain son of evil on a lonely road met a peasant taking to market two large goatskins of oil, and, coveting the superior donkey carrying them, bethought himself of a method by which to get possession of it. Pretending to be anxious to buy the oil, the owner was persuaded to unload the two skins upon

Photo by American Colony Photographers, Jerusalem

A PALM FALLING PREY TO THE FULL-GROWN LOCUSTS

"Even on the scarce and prized palms they had no pity, gnawing off the tenderer ends of the swordlike branches, and, diving deep into the heart, they tunneled after the juicy pith" (see text, page 543).

Photo by American Colony Photographers, Jerusalem

A NYMPH CAMP

the ground and to open one for the supposed customer to see and taste. Once this son of evil had sampled the first skin he got the owner to hold the mouth shut while he should examine its mate. Having done so, he now pretended to wish to retaste the contents of the first skin, for which reason the owner held the second closed with his other hand. Thus the oil vendor found himself, both hands engaged, squatting between the two skins of oil, while the son of evil rode away on the donkey."

Essa smiled and his beady eyes again twinkled. "You see," he added, "while I am holding the locusts at bay on this west side, they are entering over the south wall, and I am in the same dilemma as the fellah who had both hands occupied holding the oil skins shut, and should he drop them to rescue the donkey the oil would naturally spill."

Visiting Essa the next day, it was observed that half the bean patch had disappeared, for despite Essa and our combined efforts the tenderer plants throughout the garden were slowly vanishing. Chaffing Essa in fun for thus yielding the bean patch to the ravages of so weak a foe, he again stopped his work (few Arabs can work and talk at the same time, the hands being needed to gesticulate with) and answered with a parable, which ran thus:

"A certain hunter secured a living by making shepherds' flutes of bones taken from eagles' wings. One day, being without his gun, by chance he stumbled upon a carcass on which a number of eagles were perched, stupefied from overeating. Crawling stealthily up, he seized the legs of the two largest birds. They struggled to escape; then, flapping their wings, started raising the hunter gently from the ground. Still so riveted were his thoughts upon the eight flutes he was going to make from their bones and the two megedies* he would get for each, that he did not realize his danger till too late. Looking down, he now saw the earth slowly receding from below him, when he heard a faint voice from a passer-by saying: 'Let go of one and hold on to one.' He did so, and one eagle, unable alone to sustain his weight, brought him to the earth safely, with one eagle bagged. So you see," Essa drew the lesson, "half a bean patch is better than none, just like the common saying, 'Half a stomach full removes the necessity of having a full one.'"

*A *megedie* is a Turkish dollar, equaling about 83 cents.

HAVOC CAUSED BY YOUNG FLYING LOCUSTS

In the early days of June a few scattered locusts of a decided red color were seen about the tree-tops. Some supposed them to be a kind of grasshopper, for they were so different in color to the fliers that first came and laid their eggs that it was difficult to detect in them the resemblance to the parents.

On the 10th of June the air all at once was filled with quantities of these new flying locusts, with the thin transparent wings, producing the effect of a large-flaked snow-storm. It was at first hard to realize that these had not, as most supposed, flown in from elsewhere, but *right under our eyes had been transformed from the small, creeping locusts—a process we shall soon describe* (*see page 543*).

During the day they kept busily hovering about from tree to tree or alighting on some green patch, while toward evening they settled for the night by myriads upon the olive trees, almost covering them and transforming the dark green foliage into a distinctive red appearance. At once they attacked the small berries, which fell to the ground like hail, along with occasional leaves, and as the fliers wrought destruction above, the creepers devoured what fell below; so that on the trees attacked often not a berry was to be found in the morning.

Up to this time the olive orchards had suffered comparatively little. The creeping locusts had not seemed to care for the tough, bitter leaves while better things were at hand, and as a rule only severely damaged individual trees where other food was scarce. But now that these ravenously hungry, freshly moulted fliers appeared, food had already become scarcer, obliging the creepers to seek the heretofore despised olive, crawling up

MAP SHOWING THE REGION OF THE LOCUST PLAGUE WHICH RAVAGED THE ENTIRE LAND FROM "DAN TO BEER-SHEBA" (SEE PAGE 529)

the trunks layers deep. Between the two they stripped every leaf, berry, and even the tender bark, leaving only, where such existed, the green tufts of the poisonous mistletoe.

Likewise every variety of tree was attacked and stripped, with the sole exception of the Persian lilac (*Melia azedarach* L.) and oleander bushes (*Nerium oleander* L.). The succulent cactus (*Opuntia Ficus-indica* L.) they seemed very fond of, but instead of commencing on the edge of the large leaves, they ate away layer after layer over the whole surface, giving the leaves the effect of having been jack-planed. Even on the scarce and prized palms they had no pity, gnawing off the tenderer ends of the sword-like branches, and, diving deep into the heart, they tunneled after the juicy pith (see page 539).

LAMPS NEVER BEFORE DIM ARE BEING EXTINGUISHED FROM LACK OF OLIVE OIL

Last spring the olive trees were overloaded with bloom and a fine crop was anticipated. Now the majority of the groves have been so severely injured as to render them fruitless for several years (see page 534). As last year was the off or bad year, olive oil, usually so plentiful, is now high-priced and almost unprocurable, and being one of the food staples of the poor, taking the place of meat and butter, the loss of this crop, combined with the grapes, no doubt will outweigh, economically and commercially, the destruction caused to all other crops combined.

From days immemorial olive oil in this land has been used as fuel for lighting sacred lamps. Because of the locusts, lamps never before dim, hanging in Christian churches in front of icons and altars, are daily being extinguished, just as the sacrifices of Judah's Temple were unwillingly suspended after the locust devastation described by Joel: "Gird yourselves, and lament, ye priests: howl, ye ministers of the altar,—for the meat offering and drink offering is withholden from the house of your God" (Joel 1:13).

One bright spot, the only silver lining to the cloud yet seen, was indirectly caused by the annihilation of the grape crop, viz., already "drinks" have doubled in price; so that it is unnecessary with Joel to say, "Awake, ye drunkards, and weep; and howl, all ye drinkers of wine," because they are already doing it (Joel 1:5).

CHANGING THE NYMPH SKINS

At first the finding of a creeping locust in the act of changing its skin was a distinct novelty, for usually the process was effected during the early hours of the morning (see also page 522).

The pupa now had its entire growth. The large wings of its future state were fully developed and neatly folded up in the four membranous cases, resembling tiny wings (see page 536).

As the pupa neared this last moult it seemed to lose all appetite and seek a refuge from its brother locusts, for reasons we shall later see. To this end dry bushes and trees entirely devastated of any green or locust food were the usual nymph camps, while rubble walls and stone piles often formed substitutes—all such situated in a sunny, warm place (see page 532).

Just as it is about to moult the small body becomes much inflated with air; the bright yellow color of its skin seems to fade away and give place to a somber brownish red, the fact being that the outer skin, just about to be shed, as it loosens from the body, becomes semi-transparent, and we can actually look through it onto the outer skin of the future flier.

As the locust labors to release itself from the old shell, we see the new eyes emerging, leaving behind their old transparent films resembling miniature automobile goggles. With much shoving and pushing, the head alone emerges, the long wings slowly unfold from the sacks containing them, and the entire body, legs and all, drops out of its old shell.

Instead of depending upon a framework of bones within its body to give it the required strength and stiffness, the locust relies upon its tough outer skin, and therefore, now that it has lost its old shell, it cannot be otherwise than limp and soft, so that it has to remain still until the hot sun and dry air have hardened and stiffened it anew.

As the locusts moult and dry they begin to try their wings—first a few feet from the ground, then into the tree-tops, where they spend about two days and nights, and with insatiable appetites build up solidly their frail bodies, till, at some unknown and unheard signal, they fly skyward, collecting like a cloud of dust in a whirlwind, and migrate. Thus every few days, after great numbers have moulted, the air all at once would be thickened by the countless numbers leaving the country, while others of the creepers moulted and took their places, finally ending in the complete clearance of the land of the pupa.

It was noticed that these new fliers never collected for migration except when a strong west wind was blowing, which therefore carried them due east.

THEY COVERED THE FACE OF THE WHOLE EARTH, SO THAT THE LAND WAS DARKENED

Twice Bedouins from En-gedi, the historic spring situated on the western shores of the Dead Sea, reported that in passing many locusts had fallen into this salt lake and were washed ashore in huge piles, which news, however, lacks confirmation. One thing seems certain from the course they took when leaving here—that they must have been making for the great desert just east of the arable range of Moab.

Similar must have been the case in Joel's experience, for we read from his minute and graphic narrative: "And the Northerner will I remove far from you, and drive him into a land parched and desolate, with his face towards the eastern sea (Dead Sea), and his rear towards the hinder sea (Mediterranean),—then shall come up his ill odour, yea his stench shall ascend" (Joel 2:20).*

That Joel depicts faithfully, if not even mildly, the bad smell of the dead locusts, no one who has got even a whiff of their putrid masses can ever doubt. In Nazareth, to which we have before alluded, where so many were crushed to death in the narrow streets, actual observers state that the air for awhile was so putrid and vile as to be almost unbearable

* The Emphasised Bible, Rotherham.

We have before noted that Jericho escaped the ravages of the creeping locusts (see page 533), but now, in passing the Jordan Valley, these fliers of recent date came in clouds sufficiently dense to darken the sun and cleared this Jericho oasis of its vegetable gardens and the leaves from the fruit trees, rendering it for a while as barren as the parched wilderness encircling it. Unlike the rest of the country, where the fliers (not to mention them in the creeping stages) remained for a couple of weeks, here the entire devastation was wrought by two visits lasting but a day or so each, after which diligent search could not produce a single locust.

Similarly, at the time of the Israelitish exodus, they formed one of the most grievous of the Egyptian plagues, and just as suddenly that plague ceased and the locusts were no more.

"And Moses stretched forth his rod over the land of Egypt, . . . and when it was morning, the east wind brought the locusts. And the locusts went up over all the land of Egypt; . . . very grievous were they. . . . For they covered the face of the whole earth, so that the land was darkened; and they did eat every herb of the land, and all the fruit of the trees, . . . and there remained not any green thing . . . through all the land of Egypt. Then Pharaoh . . . said I have sinned . . . entreat the Lord, that he may take away from me this death only. . . . And the Lord turned a mighty west wind, which took away the locusts, and cast them into the Red Sea; there remained not one locust in all the coasts of Egypt" (Ex. 10:13-19).

LOCUST CANNIBALISM

One strange revelation while watching the fascinating insects was to find that, contrary to expectations, locusts are not strictly vegetarians, being especially fond of the taste of flesh of their own kind.

While on the usual march, vegetable food being still abundant, it would often be seen that a larger locust would, without provocation or warning, walk up to a smaller one and with one bite nip off one of the long back legs. The victim seemed not to care, unless it happened to

THE RIVER JORDAN, WHERE THE CHILDREN OF ISRAEL ARE SUPPOSED TO HAVE CROSSED INTO THE PROMISED LAND

"One remarkable feature is the variety of soils and climatic conditions under which these eggs were laid. In the Jordan Valley, earth's lowest spot, 1,300 feet below the Mediterranean, we find them deposited on the very banks of this historic river, notably at 'the Ford,' where it is supposed the Children of Israel passed over into Canaan (Josh. 3); also farther down toward the Dead Sea, in soil heavily impregnated with alkali, where are the 'slime pits' into which probably, during their retreat, the kings of Sodom and Gomorrah fell when in full flight from Chedorlaomer and his allies" (Gen. 14) (see text, page 516).

A TYPICAL JERUSALEM STREET SCENE

"At breakfast one morning Allie brought on a most gorgeously tinted omelet, when little Spafford, fixing his astonished eyes on it and hearing that the chickens feeding on locusts were responsible for the change in color, broke out with 'Mama, if we hatched those eggs, would locusts come out with the chicks?'" (see text, page 522).

be a signal, as usually was the case, for dozens more to pounce on it, consuming the entire insect in a few moments. Sometimes a mightier one happened by and carried off the entire prey to devour by itself.

Similarly scarcely had a locust been hurt or crushed before its fellows would be found fighting over it like dogs with a bone. At times injured locusts would be found eating away at their own bruised bodies, and not uncommon was it to find a locust minus its annuli and entrails, running about seemingly unmindful of its deficiencies.

Nor was the craving for flesh restricted to locusts themselves, for they entered into beehives, and are reported to have spoiled them by eating both bees and honey. They likewise were seen eating ants.

Still more remarkable was a story told by a doctor friend who personally treated the case in question. It ran thus: A peasant woman on the plain of Sharon, during the locust pest, employed herself in trying to drive the creeping locusts out of her orchard. She took a tiny baby with her, and laying it in the shade of a tree, proceeded to her work. Returning shortly after, she found the child literally covered with the insects and its eyes already consumed out of the sockets. The writer's little boy also was bitten on the throat by one sufficiently to draw the blood.

LOCUSTS AS HUMAN FOOD

Since in Palestine and Syria locust visitations are very rare, the eating of them is practically unknown by the Arabs, while in Arabia, where the locusts make their appearances frequently, locust flesh is even found among the articles of trade.

The natives dismember the insects, pulling off legs and wings, but not the head, and while still alive roast them in a pan over a hot fire; and after being thoroughly dried in the sun, they can be stored away in sacks. The taste is said by them to be akin to that of fish.

In the Levitical law locusts are mentioned among the clean and edible animals, as follows: "These ye may eat, of all creeping things that fly, that go on all fours, such as have legs above their feet to leap therewith (*i. e.,* jointed hind legs). . . . These of them ye may eat: the swarming locust after its kind," etc. (Lev. 11:21, 22).

It will be recalled that John the Baptist is pictured as in the desert subsisting upon "locusts and wild honey" (Matt. 3:1-4).

LOCUSTS IN ARABIC HISTORY AND FOLK-LORE

In "Hiyat el Hiwan" (Life of the Animals), by Sheik Kamal el Din el Damari, written in the year 773 of the Hegira (560 years ago), we find many a novel anecdote about the locusts, their medical properties, sayings of Mohammed and his caliphs concerning them, with primitive description of the locust itself. The following are selected quotations from this old writer, translated to preserve, as far as possible, the original author's style:

"*Jarad* (locust, from *ujrud,* meaning to scrape clean).

"When locusts come out of their eggs they are called *debbi;* when their wings appear they are called *gowga,* and when the color begins to appear in them, and the males become yellow and the females black, they are termed *jarad.* They are of different kinds—some large, some small, some red, some yellow, some white. When they want to lay eggs they choose hard places and rocks where cultivation is impossible. It strikes the place with its tail and the place opens, and in there it lays its eggs and here they are hatched and reared. The locust has six legs—two arms in the chest, two supports in the middle, and two legs on the body—and the edges of its legs are two saws. And they are of the animals that are led by a leader, and collect themselves like soldiers, and follow those which go first, whether up or down; and their spittle is pure poison for the plants; whatsoever it falls on it destroys.*

MADE OF THE SAME CLAY AS ADAM

"It was also said of Omar Ibn el Khattab† (may Allah be pleased with him!),

* Much of the above is quoted by Sheik Kamal el Din from the Koran.

† Omar, the second caliph, who in 637 conquered Syria and Palestine and received the keys of Jerusalem.

when he was caliph (that he said), 'I heard the Sent of Allah (on whom be the blessings of God and peace!) (referring to Mohammed) say that God (to whom be ascribed all honor and glory!) created one thousand nations (multitudes or hosts), six hundred of these on sea and four hundred on land, and the first to be destroyed of these nations are the locusts, and if the locusts are destroyed the (other) nations shall follow.

"The above was translated (explained) by Mehmed Ibn Essa el Abdi (to mean) that the locust was the first to be destroyed because it was created from the clay that was left over from the piece Adam was made of."

According to Tibrani, author of one of the works known as the *"Hadith,"* or oral sayings of Mohammed, the latter is credited with saying, concerning the locusts: "There is written on it 'I am Allah; there is no other God but me, the Lord of the locusts. I provide for it when I wish and send it to some as a blessing, and to others as a woe when I choose.' "

WRITTEN CHARMS TO KEEP LOCUSTS AWAY

"To keep locusts away from a field the following is used: Take a hollow reed and place in it the following inscription, and bury it in the field or vineyard, and the locusts will not harm the place by Allah's permission: 'Praise be to God, the Lord of all creatures, the Most Merciful. Blessing be on our Lord Mohammed, and upon the prophets who are associates with our Lord Mohammed, and say peace. Destroy their little ones, and kill their big ones, and corrupt their eggs, and take away their mouths from our sources of living and from our goods! Thou art the one who answers prayer. I have put my trust in God, my Lord and your Lord. There is not an animal but he looks after it. Keep me in the right path. Oh thou above all the merciful ones art the Most Merciful, grant our prayer.'

"This recipe is good and tried. One of the *ulama* (learned men), whose name at present escapes me, told me that 'if locusts infest a country, and you want to get rid of them by the help of the Almighty God, take four of those locusts and write on each of the four wings of each (locust) four texts from the Holy Book of the Most High God; then take the locusts and let the first go, saying: 'Depart from here; Allah shall suffice you; he is the all-knowing listener;' and then the second, saying: 'Put a hindrance between them and what they desire;' then the third, saying: 'Depart, may Allah cause your hearts to depart;' then the fourth, saying '(go) to where you are destined, or, if it so be, to your comrades.' "

The author of *"El Maarif"* (an Arabic Encyclopedia) gives a simpler method of fighting them, and this is found as follows: "If you see locusts advancing towards a village, hide and let none appear, and if they see no one they will pass on, and if anything is burned and it smells the burning, it will not come to that village. And they have said other things beside these."

LOCUSTS IN ARABIAN PROVERBS

"A Bedouin saying is, 'A date is better than a locust.' "

"The enemy came like wide-spread locusts."

"More barren than the locusts" (can make them).

"More noisy than the winged locusts."

"You can't catch him like Ayar's locust." (Ayar was roasting a locust and put it to his mouth before it got totally burned, and it got loose and flew away.)

"To take away freckles, anoint them with the eggs of locusts."

"If one sees locusts in their dreams, it means torment, because locusts were one of the plagues that Moses tormented the Egyptians (with)." "If you see creepers, then you will meet bad men." "If locusts fall somewhere and you eat of them, then it means plenty and abundance." "If you see it in kettles and in (cooking) pots, then you will have lots of money." "If you see it rain locusts of gold on you, then it means that God will restore to you what has been lost to you, like he did to Job, on whom be peace."

The following is a description of the locust as found in these old Arabic works and which is still commonly repeated by the natives:

"The locust has the form of ten of the

Photo by American Colony Photographers, Jerusalem

A CIRCUMCISION PROCESSION

Such events are the time for much feasting and joy. The little boy is dressed up and paraded around, riding in front of his father

giants of the animal world, weak as he is—face of a mare, eyes of an elephant, neck of a bull, horns of a hart, chest of a lion, stomach of a scorpion, wings of an eagle, thighs of a camel, legs of an ostrich, and tail of a serpent."

A SPEAKING LOCUST

Since the present locust invasion has left the country other cures than those here related have been vouched for. According to an elderly sheik, when the locusts appeared here fifty years ago a certain Persian brought bottles of water with him from his country and suspended them in the two large mosques, and right away black birds, like pigeons, called "Samarmar," collected in endless numbers and miraculously devoured the locusts.

While the winged locusts were still here Aisha brought the news that a native of the Mount of Olives had caught a locust, and as he held it between his fingers it spoke, advising mankind not to fight the locusts; for if they did a worse calamity would befall them; and so frightened was the peasant that he took it to one of the highest officials, where it repeated what it had previously said, and at once orders were sent out to stop the locust fighting.

It is needless to say that no such orders were ever heard of. Aisha repeated the story to us as if she was ashamed to be found fully believing it, but still as if she was afraid not to, while Abu Baddir stood by and boldly placed himself as thoroughly crediting the tale.

THE FRUITFUL PALM TREE

One morning while watching the fascinating process of a locust moulting on the dry twigs of a tree (a once beautiful pomegranate in a corner of the yard), Essa was called to look on, and viewing the process for the first time, he broke out, saying, with many gesticulations: "Subhannk ya Rub" (Thy majesty, Oh Creator!), "Amant b'ism Allah" (I believe on the name of God), etc., etc.

An Occidental present mused on what might happen if these newly winged creatures should remain in the country and lay their eggs. The young larvæ would then be here just in time to destroy the coming grain crops, which this year so mercifully escaped. We shuddered at the thought, for not yet had any of them migrated, which they did subsequently, thus allaying such fears.

Essa, no longer able to contain his feelings, broke out with "Don't be foolish! Have you not been told the story of Moses and the black dog? Well, the prophet Moses (on whom be peace) once asked Allah which of all beasts he most despised, and 'the black dog' was the reply. Moses, thereupon securing a black dog, removed it into the wilderness where no one passed by and left it chained to a rock. Returning a considerable period later, Moses was surprised to find the dog well and fat, with a pure fountain of water filled with fish, on which it had been subsisting, before it.

"When Moses wondered at the sight, Allah answered: 'Oh Moses, with all life which I have created I have also created the necessary livelihood, and while I despise the black dog, yet will I not allow it to hunger.'" Thus Essa drew an optimistic moral that even should the locusts return, the "Almighty" would provide.

A story is told of an aged man planting a young date palm and of the king passing by and wonderingly questioning the peasant as to his reasons for doing so, as he never could live to see it fruit. The planter replied: "Our fathers planted for their children and we plant for our children," which answer so pleased the king that he ordered 100 gold "dinars" to be given him as a reward. Immediately the old man said: "See, oh king! the date palm has already borne fruit." The king, doubly pleased at this second reply, ordered another gift, to which again the old man replied: "See, oh king! this newly planted date slip has already borne two crops."

In like manner Essa's optimism has already borne fruit. A ship loaded with flour, sugar and rice, and a few other edibles has since arrived, sent by kind hearts and hands in America to the needy here, irrespective of creed, color, or religion. Thus the locust evil has been in part mitigated, and undoubtedly the palm tree will still continue to bear fruit.

Photo by A. W. Cutler

THE ORIGINAL DARBY AND JOAN, GALWAY, IRELAND

They are starting off to market. The old lady has not annexed her husband's pipe. It is her own. It is a far cry from the clay pipe to the cigarette used by many women of European countries as well as in our own, yet it proves the truth of Kipling's line, "The Colonel's lady and Judy O'Grady are sisters under the skin."

Photo by A. W. Cutler

ALONG A COUNTRY ROAD IN COUNTY GALWAY, IRELAND

The keen sense of humor of the Irishman of the old school is proverbial. An English tourist, seeking local color for a story of the country and people, met an old man like the figure above, on the highroad one day. "Good-day, Pat," said the Englishman, "what race of kings do you spring from?" To which Pat replied without a moment's hesitation, "We don't spring from, Your Honor; we spring at 'em."

Photo by A. W. Cutler

TYPICAL DWELLING ON ACHILL ISLAND, ON THE EAST COAST OF IRELAND

Note the curious custom of netting the thatched roof, the ends of the net being weighted with large stones. The little colleen on horseback has been busy since daylight, bringing in many loads of peat for the campaign against the relentless enemy—winter.

Photo by A. W. Cutler

THE RETURN FROM MARKET: STILL A FEW PENNIES LEFT

A very distinct type of market woman who may occasionally be seen in many parts of England, especially around Worcester. The necessity for saving every penny in these dark days of war has come home most forcibly to every Briton, man and woman, rich and poor alike.

Photo by A. W. Cutler

FEEDING THE DUCKS. A DOMESTIC SCENE IN RURAL GALWAY, IRELAND

There has been, and is, much poverty in the bleak, unsmiling, rock-bound coast of Ireland, where getting a living out of the ground is like trying to pass a camel through the eye of a needle, yet some of the world's greatest writers, statesmen, poets and painters, not to say fighters, have come from the poor yet undaunted people of these districts.

Photo by A. W. Cutler

A COTTAGE SCENE AT THE QUAINT VILLAGE OF LITTLE COMBERTON, WORCESTERSHIRE, ENGLAND

It does not require a great stretch of imagination to fancy such a scene as having stepped from a page of Dickens. Surely happiness and old age go hand in hand here.

Photo by A. W. Cutler

A RUSTIC WAYSIDE COTTAGE AT DEVONSHIRE, STANDING OFF THE HIGH-ROAD TO EXETER

The woman standing at the entrance to her humble home has a son at the front, and one cannot help think that the recruiting sign nailed on the gnarled old tree, which induced him to enlist, is a badge of their loyalty to king and country.

Photo by A. W. Cutler

A GLIMPSE OF COUNTRY LIFE IN THE ABBERLEY HILLS, WORCESTERSHIRE, ENGLAND

Children are the same the world over; and the English kiddies enjoy the ride on the pasture gate just as much as our own. The outdoor life and healthful food of children in rural Britain give them an enviable start in physical development.

Photo by A. W. Cutler

IN THE HEART OF DEVONSHIRE

This scene gives some idea of the picturesque lanes which are such a charming feature of this beautiful country, so familiar to all in song and story.

Photo by A. W. Cutler

THE LITTLE GRAY HOME IN THE WEST

A rustic scene at Lustleigh, Devonshire. The romantic and stirring history of lovely Devon seems to meet one at every turn and is heightened by the quaint old houses and the splendid stands of century-old trees.

Photo by A. W. Cutler

SCENE IN A WORCESTERSHIRE FARMYARD, ENGLAND

This goose is mothering a bevy of young ducks, and, as may be observed, she is taking care of them with a considerable show of spirit.

ELY CATHEDRAL, FROM THE SOUTHWEST, ENGLAND

The Cathedral of Ely is one of the largest and most imposing of the many cathedrals for which England is famous. With a length of 520 feet and a breadth of 77 feet, it yet does not sacrifice grace for size. It was begun more than 800 years ago by the first Norman abbot. Its great castellated west tower is unlike that of any other cathedral tower in England, seeming to suggest more military than ecclesiastical architecture.

SALISBURY CATHEDRAL FROM THE SOUTHWEST ENGLAND

Great Britain affords no better example of pure early English architecture than Salisbury Cathedral. Having enjoyed the rare advantage of being begun and finished within forty years (except for the final story of the tower and the spire), it is remarkable for the uniformity and harmony of its construction. There is scarcely a trace of foreign influence in the building. Great architects have declared it to be "one of the best proportioned and most poetic designs of the Middle Ages."

Photo by A. W. Cutler

AT THE CLOSE OF DAY

A simple scene at the village of Defford, Worcestershire, England. Note the timbered farmhouse of generations agone. Small wonder that England has produced so many wonderful painters when nature provides artistic inspiration along every rural pathway.

THE INTERIOR OF WINCHESTER CATHEDRAL, ENGLAND

This cathedral, except for St. Peter's in Rome, is the longest church in Europe. It measures 560 feet in length and 208 feet across the transepts and incorporates every style of English architecture from the Norman to the Perpendicular. It is popularly supposed to have been dedicated to St. Swithin, whose traditional connection with the weather is described in the unhistoric legend that the removal of his body to the shrine prepared for it was delayed for forty days by rain.

LICHFIELD CATHEDRAL, ENGLAND

This Cathedral, built of red sandstone, and dedicated to St. Mary and St. Chad, is more than six hundred years old. The diocese of Lichfield was once coterminous with the kingdom of Mercia, and no fewer than twelve other modern sees once were comprised, wholly or in part, within its borders. Lichfield Cathedral has been styled the "Queen of English Minsters," and though surpassed by others in age, size, grandeur of site, and elaborate decoration, it is not surpassed by them in exquisite symmetry, proportion or picturesqueness of general effect.

ALASKA'S NEW RAILWAY

IN AN orderly, carefully planned, economical manner, the Alaskan Railroad is being built on schedule time. Sixteen days after the President had selected the Susitna route for the government line to connect Seward and Fairbanks, engineers and workmen were on the ground at Ship Creek, Alaska, laying out and preparing the first construction camp (see Map of Alaska, 15¼ x 20 inches, in four colors, NATIONAL GEOGRAPHIC MAGAZINE, February, 1914).

In six months or less, 70 miles of purchased railroad, previously constructed by private enterprise, have been partially rebuilt and put into condition for light traffic, more than 30 miles of new road-bed have been cleared and graded, bridges and trestles constructed, and the line made ready for track-laying.

Next year will see the Matanuska coal fields opened for use by a railroad connecting them with tidewater at Seward, and a long arm of the northward line from Matanuska Junction flung toward the interior of Alaska.

From that point, the question of how soon the first locomotive whistle blows in Fairbanks will depend very largely upon how fast Congress makes available the money necessary for construction work.

As a result of the work to date, it may safely be said that the government's first great venture in railroad building will be completed well within the estimated cost, over a route which promises to show surprisingly quick returns in the development of mineral, agricultural and other natural resources, and to demonstrate within a very few years that this great Territory is indeed a veritable El Dorado (see page 585).

ALASKAN DIRT "FLYING"

Without sensational feature or incident, a force of nearly 1,500 men were at work during the past summer "making dirt fly" along the shores of Knik Arm of Cook Inlet. Engineers and surveying parties waded and swam the icy waters of glacial streams, hung suspended by ropes over high precipices, and fought mosquitoes in the marsh and tundra of the lowlands, locating the line, planning cuts, embankments, and tunnels, and determining sites for bridges along the rivers of the interior (see page 577).

The line to the Matanuska coal fields along the shifting and treacherous bottoms, and following the precipitous banks of the river of that name, has been completely located and staked, ready for the axemen, dynamite, and pick-and-shovel gangs. Northward from Matanuska Junction along the Susitna, through Broad Pass, past Mt. McKinley, and through the gorges and canyons of the Nenana River, the engineers have completed their work of location to the Tanana, from which point to Fairbanks one of three carefully investigated routes has been chosen.

So entirely without theatrical effect has been the beginning of this actual construction of the railroad which is to mark the opening of the settlement of Alaska that men in the interior, to whom for years the near vicinity of vast deposits of precious and baser metals, unutilized, and unutilizable without transportation, has been a Barmacidean feast, still refuse to credit the statement that the railroad is coming.

Although destined to be the means of bringing to the coast the Matanuska coal to smelt the copper, tin, gold, and other metals now either unmined or shipped perforce to the United States for smelting, no great caravan of treasure-hunters mingles with the laborers who dig on the road-bed for the steel highway.

GRIZZLY BEARS ROAM OVER SITES OF FUTURE CITIES

The great, brown grizzly of the north, the ptarmigan, and the shy mountain sheep of these wilds still inhabit the mountains and grassy plains destined within a decade to be the sites of busy industrial cities. The little army of workmen on Uncle Sam's newest big job eat Chicago beef or occasional game of their own shooting, within sight of meadow lands and hillsides where future herds of sheep and cattle will graze, and busy farmers will plow and plant and reap to

Photo by Hettels

THE TERMINAL OF THE U. S. GOVERNMENT RAILWAY AT SEWARD, ALASKA

feed the workers in the cities and mining camps (see page 586).

In May, 1914, the Alaskan Engineering Commission was created by President Wilson, to act under Secretary of the Interior Lane in making investigations of proposed railroad lines in the Territory, to enable the President to decide on the most available route from an ice-free harbor in the south to the navigable, winter-bound rivers of the interior. The act of Congress of March 12, 1914, had authorized the President to locate, build, or purchase and operate a system of railroads in Alaska, at a cost not to exceed $35,000,000. An appropriation of $1,000,000 was made immediately available.

The government was particularly fortunate in the selection of the members of the Engineering Commission. The men chosen are leaders in their profession, of wide experience, and possessed of the imagination, determination, and fertility of resource which equip them thoroughly for their difficult task of penetrating the mountains and wilds of unsettled country, locating and building therein a railroad.

NO MORRIS-CHAIR JOB

Their's was no Morris-chair job. It was not a matter of sitting in a comfortable office and directing activities of a field force, but of each member of the Commission personally leading and directing exploring parties, seeing the country with his own eyes, and amid the glaciers, streams, mountains, and valleys selecting with careful judgment a safe and practicable route for a great governmental highway, intended to open to settlement the last great wilderness of the United States.

William C. Edes, of California, chairman of the Commission, was chief engineer of the Northwestern Pacific Railway at the time of his appointment. Many eminent engineers and railroad men recommended him as the best qualified engi-

Photo from U. S. Department of the Interior

VIEW LOOKING SOUTH, SHOWING THE SITE OF THE PROPOSED ALASKAN RAILROAD CROSSING OF MATANUSKA RIVER

neer in the United States to locate and build the Alaskan road. He has located and built some of the most difficult railroads in the West. Mr. Harriman chose him to locate the new lines across the Sierra and the Siskiyou Mountains. The Alaskan work is in his charge, and associated with him are two younger men—Lieut. Frederick Mears, U. S. Army, and Thomas Riggs, Jr., of Utah.

Lieutenant Mears is one of the young veterans of the Isthmian Canal construction. As superintendent of the Panama Railroad, he relocated and reconstructed a large part of that line and operated it successfully. Governor Goethals recommended him as the best equipped of all the excellent engineers at Panama to grapple with the difficult problems of railroad location and construction in Alaska.

Photo by Laurence

VIEW OF UPPER KNIK ARM, JUST SOUTH OF MOUTH OF KNIK RIVER: ALASKA

This picture was taken September 28, 1915. "Knik Arm is a narrow reach of Cook Inlet. On its shores is the town of Anchorage, the basic camp for the building of the Alaskan railroad" (see text, page 576)

Mr. Riggs brought to the Commission an intimate knowledge of Alaska and Alaskan conditions, having lived in and explored that country for the greater part of 16 years prior to his selection for membership on this Commission. At the time of his selection he was chief of the Alaskan Boundary Survey.

THE PRELIMINARY SURVEYS

The summer and early fall of 1914 were devoted to examinations and investigations of the several routes from the sea to the interior of the country. About half a million dollars were spent in this work, which necessitated the organization of no less than fourteen field parties, each headed by an experienced engineer or topographer. These parties were made up of from fifteen to twenty men each.

Quick action and results were demanded and secured. On May 2, 1914, President Wilson directed and authorized Secretary Lane to take such action as was necessary in having these surveys made. On May 8 the Secretary of the Interior directed the members of the Engineering Commission, who in the meantime had been selected and appointed by the President, to proceed to the field.

The Commission arrived in Seattle May 22, rented offices, started the necessary machinery in motion to complete the organization, employed the additional men required, and purchased and shipped to Alaska the necessary supplies and equipment for pushing the several surveys. The ordinary method of carrying on surveys in the interior of Alaska, and the most economical, would have been to transport supplies by sled through the snow in winter, "caching" them at intervals for summer use.

It was too late in the season, however, when the Commission began its work, to use this method, and expensive pack outfits had to be organized to transport the equipment and supplies of the fourteen parties which were formed for the survey work. One hundred and twenty-eight horses and mules were purchased in the Northwestern States and taken to Alaska with the survey parties. Seventy-four others were bought in Alaska.

The first party left Seattle on May 26 for Alaska, and the entire organization was in the field by a little after the middle of June. Two general routes from the coast to the interior were investigated by the Commission: First, the route starting from Cordova, or Valdez, and extending northward by the Copper River, Tonsina River, Delta River, and Tanana Valley, in the vicinity of Fairbanks; second, the western route, starting from Portage Bay, or Seward, and following the shores of Turnagain and Knik Arm; thence northward up the Susitna Valley through Broad Pass, and down the Nenana River to its junction with the Tanana, and thence by one of the suggested routes to the vicinity of Fairbanks.

APPORTIONING THE WORK

In the division of the work to accomplish this general result, two parties made a survey and valuation of the Alaskan Northern Railroad, and explored alternative routes along the Kenai Peninsula. Another made a careful survey in the vicinity of Passage Canal, while still another surveyed the route from the Passage Canal northward for probably 65 miles. Three parties covered the remainder of the distance of the western route to Broad Pass and surveyed a branch to the Matanuska coal fields. Five other parties covered the country north of Broad Pass, one party surveyed from the Susitna to the Matanuska coal fields, one party surveyed a connection between the Matanuska coal fields and the Copper River and Northwestern Railway at Chitina, and one party made a reconnaissance from the Susitna to the Kuskowin and the Iditarod country.

These parties were each in charge of a skilled locating engineer, topographer, or reconnaissance engineer, and were composed of assistant engineers, transit men and levelers, chainmen, rodmen, axemen, cook, and cook's assistant. Each had an adequate pack-train for transporting equipment and supplies, and in the section where game was known to be abundant, hunters were attached to several of the parties to keep them supplied with fresh meat, both for the purpose of reducing the cost of subsistence and for

METHOD OF TRAPPING CUTS INTO SMALL CARS

Photos by Laurence

WHERE THE U. S. GOVERNMENT RAILWAY BEGINS TO STRETCH AWAY FROM THE SEA TO THE COAL FIELDS

economizing the bulk of supplies necessary to be transported.

A 50-foot stern-wheel power-boat, equipped with a 50-horse-power engine, was designed and built in Seattle for use in transporting supplies and making reconnaissances of the shallow water of the Susitna River and its tributaries (see pages 582 and 583), and, through the courtesy of the Commissioner of the Alaskan Boundary Survey, the Commission secured the temporary transfer of the Survey's power freight-boat *The Midnight Sun* for use on the Nenana and Tanana.

HEADQUARTERS ESTABLISHED

Two headquarters or main bases of supplies were established, from which the survey parties worked, one at Ship Creek and one at Fairbanks. All of the survey parties completed their work by the middle of October. Shortly afterward the members of the Commission returned to Seattle, and later to Washington, collated their data, completed their maps and estimates, and by February had placed in the hands of the Secretary of the Interior for presentation to the President their report on the characteristics and desirability of the several routes and branches proposed, with estimates of their cost.

This report included maps on a scale of 1 inch to 400 feet of all parts of the proposed routes where locations were made, showing detailed topography for some distance on either side of the line, and a general contour map on the scale of 1 inch to 5,000 feet, with profiles of preliminary locations.

In addition the engineers presented reports on the physical characteristics through which these routes pass, character of the soil, mineral resources and agricultural possibilities, and a mass of other detailed and related information. A competent bridge engineer employed by the Commission has also gone over the plans for structures and estimated their cost.

BUYING EXISTING LINES

Of the existing railroads in Alaska, the Commission confined its investigation to those lines which might reasonably be utilized as a part of the proposed general systems. The roads examined and reported upon in this manner were the Copper River and Northwestern Railway, a standard-gauge line 196 miles long, built from Cordova, on Orca Inlet, to Kennicott; the Alaskan Northern Railway, standard gauge, from Seward, on Resurrection Bay, to Kern Creek, on Turnagain Arm, a distance of 70.8 miles; and the Tanana Valley Railroad, a narrow-gauge line, extending from Fairbanks and Chena northward 46 miles to Chatanika.

After a study of these reports and maps, President Wilson selected the western or Susitna route as possessing superior advantages for the construction of the first line into the interior. The engineers estimated that the completion of this road, which with its branches will be something over 500 miles in length, would cost upward of $27,000,000.

The President authorized the purchase of the Alaskan Northern Railroad as a part of this line at a price of $1,150,000.

The decision of the President to adopt the Susitna route was made on April 10, 1915, and at the same time, by executive order, the duties of the Alaskan Engineering Commission were extended to include the construction of the proposed railroads.

SURVEYING THE SUSITNA ROUTE

In 1914 surveying parties had reached the field in Alaska within three months after the approval of the act of Congress authorizing the construction of the railroad. In 1915 engineers and workmen were on the ground and attacking the job of laying out the first construction camp, sixteen days after the President signed the order designating the route to be built.

This route begins at Seward, on Resurrection Bay, and is to extend to Fairbanks, on the Tanana River—a distance of 471 miles. From Seward it follows the shores of Turnagain and Knik arms to the Matanuska River, and thence runs northward along the drainage of the Susitna River, penetrates the mountains of the interior through Broad Pass to the Tanana River, which it crosses, and

Photo by Laurence

THE BASE CAMP FOR RAILROAD CONSTRUCTION: FOURTH STREET, LOOKING EAST, ANCHORAGE, ALASKA

"The fact that the sale of liquor is prohibited in Anchorage, and that town lots there are sold with a prohibition clause attached and delivery of title deferred five years, probably has had something to do with this condition. . . . A jail was built and a marshal appointed at the opening of the Anchorage townsite to settlement, but the jail has been empty most of the time and the marshal has had practically nothing to do" (see text, pages 576 and 578).

Photo by Laurence

THE TENT VILLAGE ON NORTH BANK OF MATANUSKA RIVER, CALLED "MATANUSKA LANDING"

"Next year will see the Matanuska coal fields opened for use by a railroad connecting them with tidewater at Seward, and a long arm of the northward line from Matanuska Junction flung northward toward the interior of Alaska" (see text, page 567)

thence follows a route yet to be finally determined to Fairbanks. The Alaska Northern Railroad from Seward through the Kenai Peninsula, 71 miles to the head of Turnagain Arm, is included in the route.

Of the purchase price of $1,150,000 for this existing road, $504,188.49 was paid August 25, 1915, and the remainder is to be paid July 1, 1916. The price given for this road, about $16,000 a mile, including its rights of way, water front and docks, office building and yards at Seward and some light equipment, is less than the physical valuation of the property as made by the Engineering Commission.

PASSENGER SERVICE 12½ CENTS PER MILE

The road is standard gauge, as the entire government line is to be. It is well located and fairly well constructed, but in recent years has been neglected and allowed to fall into decay. The engineers estimate that from $700,000 to $800,000 will have to be spent eventually to put it into perfect running condition. Owing to the legal delays in securing title to the property, it was too late in the season when the purchase was consummated to make many of the needed repairs and improvements. The government is running a gasoline motor-car over a part of the line on a regular schedule, giving passenger service at 12½ cents a mile and freight service at 1¼ cents per pound for the 35 miles in operation.

From Matanuska Junction near the head of Knik Arm, where the main line of the government route crosses the Matanuska River, a side line 38 miles in length is to be built to Chickaloon, in the Matanuska coal fields. The grade from these coal fields to the new government townsite of Anchorage, on Ship Creek, is 4/10 of 1 per cent. As the winter climate in this part of Alaska is no more rigid than in Washington or New York, although with a somewhat greater snowfall, it is anticipated that Matanuska coal will be shipped throughout the entire year to tidewater at the ice-free port of Seward, from which point cheap water transportation will make it easily available at the many cities along the southern shore, and will quickly lead to the establishment of smelters for the copper ores of Alaska.

ANCHORAGE'S ADVANTAGES

After careful investigation, Ship Creek, now known as Anchorage, was selected as the base camp for railroad construction. This townsite, 120 miles from Seward, is on Knik Arm of Cook Inlet at the head of navigation for ocean-going steamers. It is within 5 miles of the main line of the railroad with which it has been connected by a branch (see page 570).

Although there is some ice in these waters during the winter, its advantages as a base and as a shipping point for supplies lies in the fact that it brings water transportation to a more northern point along the railroad and enables distribution of materials from there in both directions along the line, both by rail and water. Supplies to go by water are transhipped to shallow-draft boats and barges for points further south along Turnagain Arm, while in the same manner freight and supplies can be borne by water for nearly 100 miles up the Susitna River.

Anchorage will be an available shipping point for the products of the Matanuska coal fields and for freight brought from the interior for at least seven or eight months in the year. A townsite has been created here, and where a year ago was only a wilderness is now a town of about 2,000 population. An auction sale of lots by the government resulted in the sale of 749 lots at a total price of $164,210. Streets are being improved and many permanent buildings are in course of erection (see page 574).

ECONOMICAL UNLOADING

The methods employed to safeguard the interests of the government are illustrated by those adopted for unloading supplies and materials at Anchorage. The extremes of tide here are nearly 40 feet, and on the flood and ebb there is a current of from four to six miles an hour. Because of these facts, steamers cannot go to the dock and must be unloaded with lighters and barges.

The old method was to bring the

Photo from U. S. Department of the Interior

SURVEYING ON GOLD STREAM: ALASKA

The men in the picture are wearing mosquito veils. "Engineers and surveying parties waded and swam the icy waters of glacial streams, hung suspended by ropes over high precipices, and fought mosquitoes in the tundra of the lowlands and marshes, locating the line" (see text, page 567).

barges to the shore at high tide, let them rest on the beach as the tide retreated, and then unload and wait for the next high tide to float them off for another load. This practice involved delays in unloading, and demurrage on steamers in those waters is from $150 to $200 a day.

In constructing the temporary railroad wharves cradles, or "gridirons," were built alongside the docks, with pile foundations, over which the barges are floated at high water, and upon which they rest steadily as the tide recedes, the unloading difficulties being diminished by having the barges stationary while their contents are being lifted out and placed on the dock in nets or packages by the 15-ton stiff-leg derrick. As the barges and lighters may be moved on a mean tide and taken off and onto the "gridirons"

without waiting for the full flood, this also makes a saving in time.

NO DEMURRAGE PAID

To further obviate the necessity for paying demurrage, a 1,000-ton barge was purchased in Seattle, to be delivered at Ship Creek at the risk of the seller. Four smaller scows were also purchased, and upon the arrival of all this equipment the large scow was placed in use as a floating dock, enabling a ship to discharge its cargo without delay, and the smaller scows are used as lighters with which to carry the cargo from the barge to the wharves. With this system the government has no demurrage or dockage charges to pay. A cargo of nearly a million feet of lumber was discharged in this way in three days, with shifts of workmen working day and night.

In executive orders directing the construction of the railroad, President Wilson, at the outset, urged upon the Commission that provision should be made for safeguarding the health and life of employees and workmen on the road, and for caring for the sick and injured. To this end, a hospital, located in a log building, but well equipped, was one of the first preparations made at Anchorage, and here care has been given the small number of employees disabled during the season.

There have been, however, none of the conditions to contend with here that the engineers had to fight at Panama. There is little sickness in Alaska. Malaria and other fevers are practically unknown, and the uncontaminated water supply, equable climate, and good air make epidemics practically impossible. A few cases of axe cuts and minor injuries have been about the extent of cases requiring hospital treatment.

AN EMPTY JAIL

In this connection, too, it might be said that Alaska's good reputation as a country of law-abiding people has been maintained during the first season of the railroad construction and even in the opening and boom days of Anchorage. The fact that the sale of liquor is prohibited in Anchorage, and that town lots there are sold with a prohibition clause attached, and delivery of title deferred five years, probably has had something to do with this condition, while the isolation of the country and the difficulty of escaping detection and apprehension has also doubtless had much to do with curbing lawlessness. A jail was built and a marshal appointed at the opening of the Anchorage townsite to settlement, but the jail has been empty most of the time and the marshal has had practically nothing to do (see page 574).

Out of the appropriation of 1914 about $500,000 was available for use this year and was spent in making the first payment on the purchase of the Alaska Northern Railroad. With the $2,000,000 appropriated for this year it was planned at the beginning of the season to make a final location of the entire route, to rehabilitate partly the Alaska Northern, and to construct as much of the new line as possible.

PANAMA EQUIPMENT

Large quantities of construction supplies and materials have been landed at Anchorage, including a lot of steam-shovels, derricks, bridge timbers, structural steel, locomotives, flat cars, wheels, boilers, drills, shop machinery, etc., from the Panama Canal. The road-bed from Anchorage to Matanuska Junction, 35 miles, has been practically completed and made ready for track-laying, including the construction of bridges and trestles. Shipments of rails are now being received, and it is anticipated that by the first of January, 1916, this division of the line will be completed and ready for use.

Steel rails have been purchased at $30 a ton, for the 70-pound size of which the road will be built. A significant incident illustrating the advantage enjoyed by the government over private interests in purchasing and in transportation is the fact that, although the freight rate on rails to Seattle, from the mill which received the contract, is $9 a ton and the government rate on the land-grant railroads for the same service is $6.15 a ton, one of the railroads voluntarily made a special rate of $5 a ton for hauling these rails.

THE UPPER PART OF NENANA CANYON, SHOWING ROUTE OF RAILROAD

"The coal of the Nenana fields, on the northern part of the railroad, is a high-grade lignite, which is expected to furnish cheap and excellent fuel for domestic and industrial purposes" (see text, page 589).

Photos from U. S. Department of the Interior

DIFFICULT SURVEYING IN NENANA CANYON

Photo by Curtis & Miller

CLARK GARDEN AT SKAGUAY, ALASKA

"In this way each man becomes a small contractor and shares equally with all others in the returns from the job, the middleman being eliminated, and the associated contractors on the job being paid for what they accomplish, not for the time they put in" (see text, page 583).

Photo by Johnson

COAL OUTCROPPINGS ABOUT SIX MILES UP LIGNITE CREEK: NENANA COAL FIELDS

By executive order, the timber on a strip 5 miles wide on each side of the railroad route, from Turnagain Arm to Chickaloon and Fairbanks, was early last summer reserved for the use of the Commission for construction purposes. Legislation was also enacted in the last Congress whereby timber may be taken free of charge from the Chugach Forest Reserve.

TIMBER FROM SEATTLE

Because of the fact that the large timber through much of this region is widely scattered, however, and the additional fact that it is largely cottonwood or other soft varieties, while much of the spruce is small and knotty, it was found impracticable to utilize the local timber supply exclusively in securing lumber for bridge and other heavy construction, and lumber has been brought in from Seattle, at a delivered price, as low as $19 per thousand feet. The local timber will be relied upon mainly to supply piling and crossties for the entire length of the line. With the beginning of work of the railroad last spring there was a threatened stampede to Alaska in search of employment, incited by the popular notion of high labor prices prevailing there, and the probable belief that the government would pay higher wages than private employers. So far as possible this stampede was checked by giving publicity to the facts, but even then the Commission was not able to give work to all of those who applied.

Most of the clearing and grading work on the railroad is being done by contract, on the "station" or "piece-work" system, which has been followed generally in railroad construction in the Western States for years. A gang or number of men associate as partners and are given the contract for clearing right of way at so much an acre, or for grading at rates per cubic yard, according to classification. When the contract is finished the work is measured up and the gang paid at the

Photo by Curtis & Miller

A FIELD OF RHUBARB AT SKAGUAY, ALASKA

Photo from U. S. Department of the Interior

FERRYING HORSES ACROSS THE TANANA RIVER

Photo by Laurence

THE COMMISSION'S STERN-WHEELER BOAT, "MATANUSKA," LANDING SCRAPERS AND WORK HORSES NEAR MATANUSKA RIVER

"A 50-foot stern-wheel power-boat, equipped with a 50-horse-power engine, was purchased in Seattle for use in transporting supplies and making a reconnaissance of the shallow water of the Susitna River and its tributaries" (see text, page 573).

agreed price, every man receiving an individual check for his share.

SMALL CONTRACTORS

In this way every man becomes a small contractor and shares equally with all others in the returns from the job, the middleman being eliminated, and the associated contractors on the job being paid for what they accomplish, not for the time they put in. Probably a thousand men have been employed on the road this summer in this manner, and their earnings have been good as a rule, depending, of course, on the individual ability of the men and of the gangs. These contractors are not boarded by the Commission, but are allowed to buy supplies and provis-

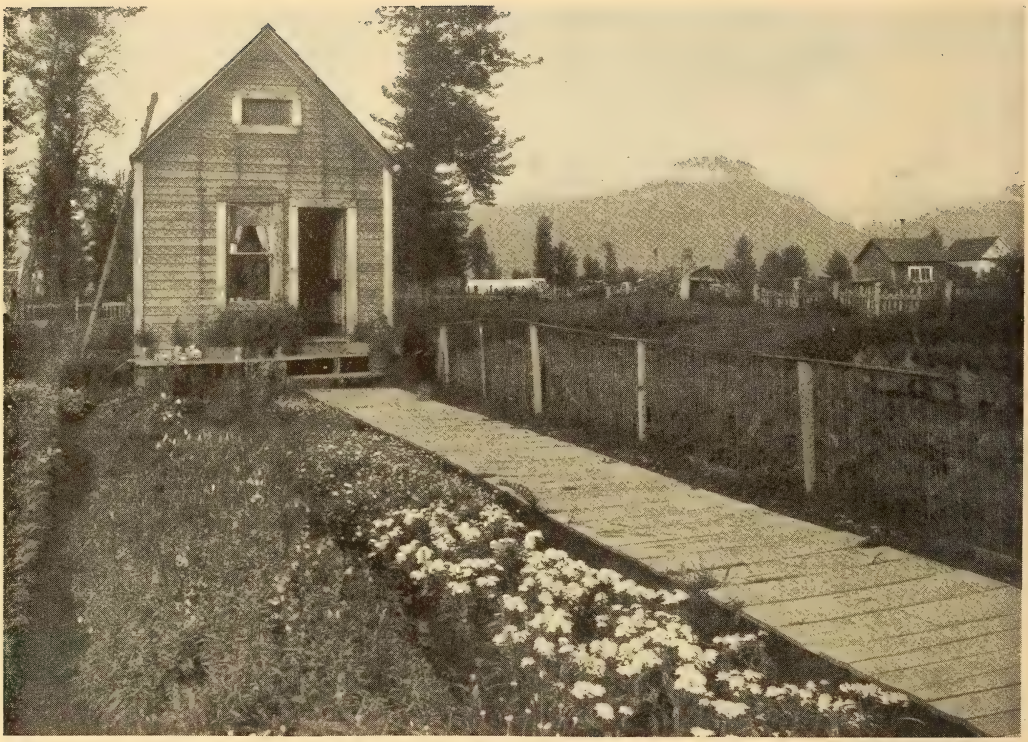


Photo by Curtis & Miller

FLOWER GARDEN AT VALDEZ, ALASKA

Many parts of Alaska are destined to become famous for their equable climate. For instance, the summers of Sitka are cooler and the winters warmer than those of Washington. The average temperature for the year is only one degree lower than that of the National Capital.

ions from the Commission commissary at reasonable prices.

No racial, sectional, or political distinctions have been made in accepting or rejecting applicants for employment. Ordinary day laborers receive about $3 a day, and are charged a dollar a day for good board at the construction camps. Eight hours constitute a day's work, and the eight-hour law has been strictly enforced. This does not, of course, apply to the "stationmen," who are contractors, and there has been some criticism of this system. It appears, however, that the complaints concerning conditions on the job do not come from the workers themselves, but from outsiders who are not so desirous of work as they are of sharing in the government appropriation.

FREE HOSPITAL CARE

A system of compensation has been adopted to provide for the care and benefit of disabled employees and the benefit of the families of any who may die of injuries received on the work. Free hospital attendance and medical attention is given by the government to all employed on the construction, whether employees or contractors; and when it is decided that injured or sick employees should be removed to Seattle or elsewhere for special treatment that they cannot receive in camp or at the Anchorage hospital, the expenses of their removal and treatment are paid by the government.

Early in the summer the Commission was authorized by Secretary of the Interior Lane to provide a recreation and amusement hall at Anchorage for the benefit of employees and their families, and this has proven a popular and much appreciated feature, which bids fair to be of even greater popularity during the long nights of the winter season.

Engineers and employees attached to

Photo by Curtis & Miller

CABBAGE GROWING AT FAIRBANKS, ALASKA

The Alaskan Railroad route "promises to show surprisingly quick returns in the development of mineral and agricultural resources and other natural resources, and to demonstrate within a very few years that this great Territory is indeed a little El Dorado" (see text, page 567).

parties in the field are paid by the month and get pay and board, as the most feasible way of providing for their keep. In fixing wage scales for other employees the Secretary of the Interior and the Commission have sought to exercise as much economy as is consistent with providing fair living wages, and have sought not to enter into competition with local industries.

The pay of laborers and the earnings of contractors compare very favorably with the wages paid for similar labor in the United States. The pay of axemen and ordinary laborers in southwestern Alaska is fixed at $75 a month and board, and in the interior at $90 a month and board. For similar work the wages paid in the Pacific Coast States is from $45 to $50 a month and board.

Because of the exhaustion of appropriations, work on the railroad this winter will have to be considerably lessened, if not suspended. Otherwise there are no serious obstacles to continuing certain classes of construction work for the greater part of the year, especially along the southern end of the line. If appropriations are made available, for instance, it would be advisable and economical to grade a considerable part of the Matanuska branch during the winter season.

PLAN TO OBVIATE SLIDES

From Matanuska Junction to the coal fields the line follows practically for the entire distance the drainage of the Matanuska River. This stream for a considerable part of the distance is banked by cliffs of gravel and sand, in places a hundred feet high or more. To attempt to cut into these banks, in many places

Photo by Curtis & Miller

REINDEER HERD ON LOWER YUKON: ALASKA

The reindeer provides the Alaskan esquimaux with meat, milk, clothing, and transportation. It is one of the anomalies of our law that the reindeer herds are under the control of the United States Bureau of Education

Photo by Curtis & Miller

HYDRAULIC MINING AT DAWSON: CANADIAN KLONDIKE

"Men in the interior, to whom for years the near vicinity of vast deposits of precious and baser metals, unutilized, and unutilizable without transportation, has been a Barmacidean feast, still refuse to credit the statement that the railroad is coming" (see text, page 567)

Photo by Curtis & Miller

A FIELD OF RYE AT RAMPART STATION, ALASKA

"The little army of workmen on Uncle Sam's newest big job eat Chicago beef or occasional game of their own shooting, within sight of meadow lands and hillsides where future herds of sheep and cattle will graze, and busy farmers will plow and plant and reap to feed the workers in the cities and mining camps" (see text, page 567).

would invite slides of a similar nature to those creating serious difficulty at Panama (see page 569).

To avoid this danger it is proposed to build up the railroad embankment along the side of the river bed, against the cliffs, diverting the course of the stream with wing dams. As the Matanuska is largely fed by glaciers, its flow is at a minimum in winter, and, despite the short hours of daylight, much of the work of grading could be accomplished with fewer obstacles and at lower cost in the winter than in the summer.

Overland transportation of supplies and equipment, too, can be made more easily and cheaply in winter. The valleys and bottom-lands of southern Alaska are generally swampy. In summer men and horses sink into the morass at each step, while the difficulties of travel through new country are enhanced by the heavy herbaceous growth, which approximates tropical jungle undergrowth in density. Under these conditions pack-horses are practically the only means of carrying supplies excepting along constructed trails. In the winter, however, roads are easily broken in the snow, and transportation of any kind becomes a much simpler and cheaper matter.

EARLY OPENING OF COAL FIELDS DESIRABLE

Reaching the Matanuska coal fields with a railroad at as early a date as possible will not only encourage quick development, but also will open up a source of fuel for the use of the Commission in railroad operation and in construction work along the northern part of the line. The Matanuska fields furnish a high grade of bituminous coal which has been found entirely satisfactory for naval use. The coal of the Nenana fields, on the northern part of the railroad, is a high grade of lignite, which is expected to furnish cheap and excellent fuel for domestic and industrial use in the interior of the country, along the Tanana and the Yukon.

No attempt is being made to add to the cost of the road by elaborate or ornate structures. It is realized that the prime need is for a road that will as quickly as possible lay open the riches of Alaska for use and her lands to settlement.

THE NATION'S PRIDE*

By Franklin K. Lane, Secretary of the Interior

IN THE development of this continent, the discovery of its resources and their highest utilization, there is a fascination to the American which is superlative. It is indeed our life, and has called out the most sterling qualities in our character. Those foreigners who write of our country often engage in facetious if not scornful comment upon our bombastic manner of telling the story of our growth and of the things achieved or possessed. They fail unfortunately to see far enough into the secret of our pride.

To have taken the prize for the largest pumpkin at the county fair, or to have milled more ore in a day than any other mine, or to have built the highest dam in the world*—such things are to us adventures which make the game of opening a new country worth while.

* This article, which gives a wonderfully impressive survey of our national resources and opportunities, has been abstracted and especially revised for the National Geographic Magazine by Franklin K. Lane, Secretary of the Interior, from his report to the President for 1915.

* The Arrowrock Dam was completed two years ahead of time and for more than a million dollars less than the estimated cost. This dam was constructed to supply the lands around Boise, Idaho, with water for irrigation. The dam will bear the following plate: "Arrowrock Dam. Maximum height 348.5 ft. Height above river bed 260 ft. Thickness at base 240 ft. Thickness at top 15.5 ft. Length along crest 1,100 ft. Length of spillway 400 ft. Concrete in dam 585,200 cu. yds., in spillway 25,400 cu. yds. Capacity of reservoir 244,300 acre feet, 79,642,000,000 gallons. Construction authorized in January, 1911, by R. A. Ballinger, Secretary of the Interior, upon recommendation of F. H. Newell, Director, and A. P. Davis, Chief Engineer of the United States Reclamation Service. Designed and

No one would smile when told that a foreign army had made an unprecedented number of miles in a day's march, or had brought into action a gun of unrivaled caliber, or built a ship of unequaled displacement or power. These are the very things on which nations pride themselves as revealing their capacity, ingenuity, and resourcefulness. They make for national self-respect and self-confidence.

THE AMERICAN'S MISSION

And so it is with the American. His place in the scheme of things is to reveal to the world what can be done in the development of a new country, and every crop raised, every school-house built, every rail laid, every nail driven is evidence that the work he is sent to do is being done. Instead of being the petty boasting of a parochial-minded provincial, this spirit is of the very essence of the highest creative quality.

It is not a figure of speech to say that every American has it in his heart that he is in a small sense a discoverer; that he is joining in the revelation to the world of something that it was not before aware of and of which it may some day make use. Men work for what they think worth while, and if they find their joy in proving that land has coal, or will raise wheat, or that a refractory ore may be reduced at a practicable cost, and tell about it proudly, they may be serving themselves, but they are also serving the world.

The clerk in the store or the mechanic in a mill may not consciously engage in any enterprise which makes this appeal, but when he learns that the government of which he is a part has within the year opened a town on the shores of the North Pacific which now has nearly 3,000 inhabitants, and has driven a railroad nearly 40 miles inland toward the Arctic Circle on its way to the coal fields of the Matanuska and the gold fields of the Tanana, he has a feeling that he, too, is participating in the making of this new world. One might say that this was nothing more than sentimental pride. There is a truer and a more dignified word for this quality; it is the expression of the American instinct for improvement.

built under general direction of F. E. Weymouth, supervising engineer, Idaho district, with Charles H. Paul, construction engineer, in direct charge, and James Munn, superintendent of construction. Completed November, 1915, under the administration of Franklin K. Lane, Secretary of the Interior."

OUR IMAGINATION IS CHALLENGED BY DIFFICULTY

We have a passion for going into the unknown, for answering the puzzles that are put to us. Our imagination is challenged by difficulty. And the result has been a century of growth, which in its magic and in its largeness casts a spell upon the mind.

Some months since I sought to learn what I could of the assets of this country as they might be revealed by this department, where we were in point of development, and what we had with which to meet the world which was teaching us that war was no longer a set contest between more or less mobile armed forces, but an enduring contest between all the life forces of the contesting parties, their financial strength, their industrial organization and adaptability, their crop yields, and their mineral resources, and that it ultimately comes to a test of the very genius of the peoples involved. For to mobilize an army, even a great army, is now no more than an idle evidence of a single form of strength if behind this army the nation is not organized.

WE CAN BUILD A BATTLESHIP ENTIRELY FROM OUR OWN PRODUCTS

An army is no longer merely so many rifles and men, cartridges and horses; but chemists and inventors, mines and farms, automobiles and roads, airships and gasoline, barbed wire and turning lathes, railroads and weather prophets—indeed, the complete machinery of an industrial nation's life. And out of the reports then made these facts stand out:

With the exception of one or two minor minerals, the United States produces every mineral that is needed in industry; and this can be said of no other country. We produce 66 per cent of the world's output of petroleum, 60 per cent of its copper, 40 per cent of its coal and iron, and 32 per cent of its lead and zinc. Tin in small quantities is produced in Alaska and platinum in Oregon, Nevada,

and California, manganese in Virginia, Georgia, Arkansas, and California; but of these latter minerals, as of nickel and some others of less importance, our supply is altogether inadequate for our consumption.*

We can build a battleship, or an automobile (excepting the tires), a railroad or a factory, entirely from the products of American mines and forests. To replenish the soil, we have phosphorus in abundance; potash is known to exist in the deposits of Searles Lake, California, which, however, is not yet commercially available, and in alunite, where it is combined with aluminum, and deposits of which are found in several States; and nitrogen can be extracted from the air by cheap hydro-electric power, as is now done in Germany, Norway, and elsewhere; so that we can feed the earth and keep it sustained.

Our soil and climate are so varied that we can produce all the grains, fruits, vegetables, and fibers known to the Temperate Zone and some found in the semi-tropics. And to crown all these, we have water power that can be made to generate perhaps as much as 60,000,000 horsepower.

PUBLIC DOMAIN SHRINKING

The public domain is rapidly growing less, which means that it is being occupied and used. Of the two hundred and odd million acres left, 12,000,000 acres have already been classified as coal bearing, over 4,000,000 as probably carrying oil, and 2,600,000 as phosphate lands. The most valuable discovery made in recent years as affecting the public domain is that the semi-arid regions may become abundantly productive under dry-farming methods. The Territory of Alaska, containing perhaps 400,000,000 acres, is now the great body of public domain. It is heavily mineralized and is a land of unknown possibilities. One gold mine there has recently erected a mill of 6,000 tons daily capacity, with ore in sight to run this mill for 50 years.

The waters that flow idly to the sea could be made to support not less than 50,000,000 people if turned upon the land that otherwise will remain pasture land or altogether worthless. The demonstration has been given that the lands of little rain can be made more fruitful than those where the rainfall is abundant. Land and water we have; the problem of bringing them together is one only of money.

When the war in Europe shut off certain chemical supplies, one of our chemists, Mr. Rittman, found a new process, which has been given to the public, by which benzol and toluol, the foundation of aniline dyes and explosives, and gasoline may be made from crude petroleum. Mr. Parsons and Mr. Moore have devised and proved a process for the reduction of radium from carnotite ores.

* The adaptability and resourcefulness of American chemists and engineers has been proved during this war as never before. A few illustrations will point this fact: Barium salts, needed for a variety of purposes, were formerly imported in large quantities, although the raw material, barytes, occurs in extensive deposits in this country. We now manufacture these salts in California, Colorado, Illinois, Pennsylvania, New York, Tennessee, and West Virginia, the new industry not only meeting the domestic demand, but also furnishing large quantities of barium compounds for export, and we are substituting domestic barytes for the foreign material for all purposes.

The substitution of sodium cyanide for potassium cyanide in the treatment of gold ores to the extent of more than half a million pounds in Colorado alone illustrates how the potash shortage is being met throughout the mining States.

Tungsten, an absolutely essential constituent in high-speed tool steel, is being mined at more points than ever before to meet the special demand in the steel-working industry; a tin smelter has been erected to reduce Bolivian ores; cobalt, which is a recent and valuable acquisition to the family of steel-alloying metals, is now being produced in quantity sufficient to lower the market price; American antimony is quoted in the metal market for the first time, and from Alaska alone more antimony ore has been shipped this year than was ever before produced from American mines in any one year; cadmium, formerly imported, is now an article of export, and in other minor metals full independence of foreign supplies is being worked out. Practically all the crude platinum from Colombia and part of the New Zealand output is coming to the United States for refining.

The position of American zinc in the world market is most striking. In the first half of 1914 the exports from the United States were $109,000, in the second half $8,650,000; and in the first half of 1915, $11,963,000, or more than a 100-fold increase over the same period in 1914, and the increase continues.

Photo by Putnam & Valentine

WATERMELON PATCH AT INDIO, CALIFORNIA

"To have taken the prize for the largest pumpkin at a county fair, or to have milled more ore in a day than any other mine, or to have built the largest dam in the world—such things are to us adventures which make the game of opening up a new country worth while. No one would smile when told that a foreign army had brought into action a gun of unrivaled power" (see text, page 589).

LIST OF EPOCH-MAKING INVENTIONS BY PEOPLE OF THE UNITED STATES DURING THE LAST FIFTY YEARS

Invention.	Inventor.	Date.
Telephone	Bell	1876
Typewriter	Sholes	1878
Cash register	Patterson	1885
Incandescent lamp	Edison	1880
Talking machine	....do.	1878
Electric furnace reduction	Cowles	1885
Electrolytic alkali production	Castner	1890
Transparent photograph film	Eastman	1888
Motion-picture machine	Edison	1893
Buttonhole sewing machine	Reece	1881
Carborundum	Acheson	1891
Calcium carbide	Willson	1888
Artificial graphite	Acheson	1896
Split-phase induction motor	Tesla	1887
Air brake	Westinghouse	1869
Electric welding	Thomson	1889
Type-bar casting	Mergenthaler	1885
Chain-stitch shoe-sewing machine	French & Myers	1881
Single-type composing machine	Lanston	1887
Continuous-process match machine	Beecher	1888
Chrome tanning	Schulz	1884
Disk plows (modern type)	Hardy	1896
Welt machine	Goodyear	1871
Electric lamp	Brush	1879
Recording adding machine	Burroughs	1888
Celluloid	Hyatt	1870
Automatic knot-tying harvester machine	Appleby	1880
Water gas	Lowe	1875
Machine for making barbed wire	Glidden	1875
Rotary converter	Bradley	1887
Automatic car-coupler	Janney	1873
High-speed steel	Taylor & White	1901
Dry-air process for blast furnace	Gayley	1894
Block signals for railways	Robinson	1872
Trolley car	Van Depoele & Sprague	1884-1887
Harveyized armor plate	Harvey	1891

As compared with this list, note the following list of important inventions that have been made during the same period by foreigners, which has been compiled from information furnished by the 43 examining divisions of the Patent Office:

Invention.	Date.	Inventor.	Nationality.
Electric steel	1900	Heroult	French.
Dynamite	1867	Nobel	Swedish.
Artificial alizarene (dye)	1869	Graebe & Lieberman	German.
Siphon recorder	1874	Thompson	English.
Gas engine, Otto cycle	1877	Otto	German.
Wireless telegraphy	1900	Marconi	Italian.
Smokeless powder	1886	Vielle	French.
Diesel oil motor	1900	Diesel	German.
Centrifugal creamer	1880	De Laval	Swedish.
Manganese steel	1884	Hadfield	English.
Electric transformer	1883	Gaulard & Gibbs	Do.
Cyanide process for extracting metal	1888	Arthur & De Forrest	Do.
Mantle burner	1890	Welsbach	Austrian.
By-product coke oven	1893	Hoffman	Do.

An oil expert, Mr. Pollard, was put to the task of saving the billions of feet of gas wasting daily into the air from the oil wells of Oklahoma, and was successful. Mr. Cottrell has devised a method of taking solids and liquids out of smelter smoke, such as sulphuric acid, arsenic, zinc, and lead.

A NATION OF INVENTORS

During the past 50 years the people of the United States have uttered two-thirds of all the revolutionary epoch-making inventions of the world, ranging from the telephone and the incandescent lamp to Wright's aëroplane and high-speed steel (see page 593). Each day we issue an average of 200 letters patent to American inventors, and the number of inventions is increasing with the years.

There are over 20,000,000 boys and girls in the public schools of the United States.

THE ERA OF SPLENDID GIVING

These, then, are the assets of the United States as revealed in but this one department—lands and waters and mines, inventors and chemists and engineers, and a new generation coming on which will add still further to the adventurous annals of peace. What has been our policy with respect to these? How may they be the more highly put to use? These questions are seen to be more vital than ever before. And at the outset let me say that I find no need for a change of policy, but only for its expansion.

We have given of our resources as no people ever did before or ever can again. Within 50 years we gave in subsidies to our railroads public lands that exceeded in size a territory seven times as large as the State of Pennsylvania. We have given to the States, for the sustaining of their schools and other public institutions, an amount that our records do not accurately state; but this we know, that 13 western States were given over 67,000,000 acres.

In addition, the Federal government gave to the States all the swamp and overflowed public lands within their borders, amounting to 64,000,000 acres by roughest approximation, upon condition that they used the proceeds to reclaim the lands—a condition which it may be idle to state has been only in part complied with.

Every country has found itself in embarrassment at the close of a great war. From Rome under Cæsar to France under Napoleon the problem arose as to what could be done with the men who were to be mustered out of service. No such embarrassment, however, came to the United States at the end of the Civil War, for out of our wealth in lands we had farms to offer the million veterans—and better use was never made of any land. Even today this "soldiers' scrip" is recognized and is filed to secure choice bits of forest lands or power sites.

Indeed, the peoples of the world were called in and tendered homes, until now, out of an acreage within the United States of a full billion and a half of acres of public domain, we have left as public lands subject to disposal and homesteads and otherwise less than 280,000,000 acres,* not one-half of which, it may safely be said, will ever prove to be cultivable. There passed out of this office last year 61,979 patents to land, some for 160 acres and some for 320 acres—donations from the nation to the courageous pioneer.

The man who finds gold or silver or iron or lead or copper, or any other of the so-called metalliferous minerals, has it for the asking—a prize for discovery. We expend $1,500,000 a year now in the making of geological and other studies of the country that we may know what we have.†

GO FORTH AND FIND

And all the revenue from the sale of public lands (less 5 per cent, which goes

* When the grants to the States are satisfied this amount will be diminished by over 15,000,000 acres.

† As a utilization in most practical form of these studies there have been published during the past year four books of an original character—geological guide-books along the western railroad lines, one along the Northern Pacific, another along the Union and Central Pacific, a third along the Santa Fe route, and a fourth along the Southern Pacific coast line. These tell by map and picture in simple and untechnical language the story of the formation and character of the land through which the tourist is passing.

to the States) goes into a fund for the building of irrigation works to reclaim the desert.

Was there ever a more generous method taken of populating and developing a new land? Surely there has been no niggardliness on the part of the government, which has not asked from those who took its lands even so much as the cost of their administration.

In doing all this with so lavish a hand the government has been expressing the generous instinct of the people and their absorbing determination to "go forth and find." For a hundred years and a little more this quest has been the drama of our life. It has given color to our civilization and buoyancy to the hearts of the people. It has been a century of revelation, and as yet we have only the most superficial knowledge of what this land is, of what it will yield to research, and how it may best be used. Its development has only begun.

TO USE, NOT TO HOLD OR WASTE

But in all our giving we have been guided by a purpose—the land that we gave was to be converted from wilderness into homes, or from rock into metal. We gave to the States and to the railroads, with a reservation of minerals. We gave to the homesteader, with a condition—the land was to be used. We gave our swamp lands, but to be reclaimed. We found our coal lands going as farms and we put a price upon them. We saw our forests being swept clean or monopolized and we held them out from the mass. Use! Use by as many as possible! The superior use! These were the things we wished and these gave form to our legislation. No homesteader receives all the lands he wishes, or even all he might use. One hundred and sixty acres was the limit, not a full section. But now he may have 320 acres if it is dry farming or grazing land—and for the latter the size might still be increased.

And he cannot have it as a speculation. It must be made a home and brought into the body of the world's producing area by cultivation.

The government was generous, but it had no intention of being a spendthrift. When it found itself being imposed upon it stayed its hand and drew back. So it came about that lands were withdrawn from entry—the Alaskan coal lands, the oil and the phosphate lands, dam and reservoir sites for power plants, and a few water holes which commanded the adjoining miles of desert. The Nation stayed its hand and drew back, so as to make sure of the right course. It wished use—use by as many as possible and the best use.

And now we have come to a point where it can be said that if Congress will pass two bills now before it there will be no resource in reserve, of all its vast treasure in lands, save national forests and national parks.

A PROGRAM OF INTERNAL DEVELOPMENT

Two years ago I presented in my report* what might be termed a program of internal development with respect to land: a railroad into the interior of Alaska; a coal-leasing law for Alaska; a new reclamation act extending the time within which payments were to be made by water-users and under which land would be forced into use; a water-power bill governing the use of public lands for hydro-electric development; a general development bill providing for a practicable method of disposing of our oil, gas, coal, phosphate, and potash without danger of monopoly or non-use. Of this program the larger portion has been adopted, but the last two failed of passage in the Senate after having been successful in the House.

The plan is to make the West help in its own development. The royalties from oil, gas, coal, and phosphate lands and from water power developed on public lands should be used for the reclaiming of the arid country and then divided with the States.

PHOSPHATE ROCK "IN PLACE"

The need for the general development bill is not difficult to present. The lands of the Pacific coast are being used intensely in some parts, and these lands call for fertilization. One of the elements

* See NATIONAL GEOGRAPHIC MAGAZINE, February, 1914, pages 183-225.

Photograph by The Associated Photographers, New Orleans

IN THE DEPTHS OF A LOUISIANA SALT MINE

"With the exception of one or two minor minerals, the United States produces every mineral that is needed in industry; and this can be said of no other country. . . . We can build a battleship or an automobile (excepting the tires), a railroad or a factory, entirely from the products of American mines and forests" (see text, page 590).

which must be restored to the soil is phosphorus. This is native in most soils, but is needed by all after long use. The orange orchards of California and the apple orchards of Oregon and Washington, not to speak of others, draw heavily upon the soil.

And for its replenishing the orchardists are buying phosphate rock in Florida, which is carried 5,000 miles by water and then inland, while in Idaho, Montana, and Wyoming we have under withdrawal nearly 3,000,000 acres of lands that are underlaid with phosphate rock. There is no law today under which this can be secured. In Montana and elsewhere throughout the West are smelters which produce the sulphuric acid necessary for the conversion of this rock into practicable fertilizer; so that the development of this industry waits only upon the passage of a law which will put this mineral at the command of those who need it.

Our coal lands are now subject to sale at appraised values based upon an estimate of the content of the land. This is at best an expert's guess, and converts each purchase into a gamble, both on the part of the government and the purchaser. The bill does not exclude this method, but supplements it with a simple provision by which the purchaser, instead of buying at hazard, may pay a royalty upon what he produces. It gives the man of moderate means an opportunity to secure a mine.

THE OIL WELL AS A PLACER CLAIM

As to oil and gas, the House committee had extensive hearings at which no practical man engaged in the industry offered any objection to the plan proposed. The existing law, under which such lands have been taken up, is to be characterized by no politer word than as a plain misfit. Oil is found hundreds and sometimes thousands of feet below the surface of the earth, yet the law applicable to its acquisition is the placer law, intended to apply to the recovery of superficial minerals.

This law is of romantic origin, for it is the outgrowth of the experience of the Argonauts who went to California in the days of '49. The measures adopted by these men for the government of their claims along the mountain streams, where they did no more than lift the river sands to the pan or rocker, finally were incorporated into law; and the governing principle of this law was that before a man could claim ownership in a placer claim he must have found gold there; and until he did, others might, at their bodily risk to be sure, attempt to make prior discovery. The utter inapplicability of such a principle to a mineral found perhaps 2,000 feet below the surface, and where the discovery must be made at a cost of twenty, fifty, or a hundred thousand dollars, is clear beyond comment.

Now, under this impossible law a large amount of public land was "taken up," and by that is meant that it was located on and thereafter became a general basis for speculation, and sometimes was developed. That the law is as hazardous to the investor as it is unsatisfactory to the government is universally conceded, and in its stead should come a measure under which the government would give a permit at first—an exclusive permit for drilling — and upon discovery within a given time an area be given as a reward for proving the ground, and adjacent lands leased upon a royalty basis.

A PRICELESS RESOURCE BEING WASTED

There is another charge to be made against the existing law more serious than its unworkability. It is supremely wasteful. If the land is leased, some control can be exercised over the manner of development. Millions of barrels of oil have been wasted by being allowed to flow into the streams, by being mixed with water, or by evaporation. There has been no such waste, I am told, in any other mining.

And petroleum is a priceless resource, for it can never be replaced. Trees can be grown again on the soil from which they have been taken. But how can petroleum be produced? It has taken the ages for nature to distil it in her subterranean laboratory. We do not even know her process. We may find a substitute for it, but have not yet.

It is practically the one lubricant of the world today. Not a railroad wheel turns

without its way being smoothed by it. We can make light and heat by hydro-electric power, but the great turbines move on bearings that are smothered in petroleum. From it we get the quick-exploding gas which is to the motor and the airship what air is to the human body. To industry, agriculture, commerce, and the pleasures of life petroleum is now essential. Therefore to waste it is a crime.

An absolute government would prohibit a barrel of it being used for fuel before every drop of kerosene, gasoline, and other invaluable constituents have been taken from it.

How much of it there is in the United States no one knows. The Geological Survey has made a maximum estimate of twenty-three billion barrels, which sounds like an inexhaustible supply; but at the rate that it is now being consumed in this country alone (265,000,000 barrels a year) this does not mean an indefinite supply, and from the rapid exhaustion of some fields it is manifest that there can be no real approximation of the oil in our lands. Whatever the supply, it should not be allowed in its crude state to compete with coal as fuel, and the government should not promote its being wasted by applying to it archaic laws under which waste is a certainty.

TURNING WATER INTO POWER

When Benjamin Franklin caught the lightning on the tail of his kite he did a lot of strange things for this world, of which we are only beginning to learn. Among these are the uses to which flowing water may be put. The old-fashioned water-wheel, which was the motive power of our early industries, is now converted into a turbine which generates electricity, and this has as great a variety of uses as the muscles of a man's arm or a horse's shoulder.

Among the other strange things done by Benjamin Franklin was to give an added and peculiar value to the ledges of granite which confine our western streams and turn them into dam sites, useful for purposes of power generation. How many of these there are on public land not yet disposed of no one knows, but we have several hundred under withdrawal, which should be freed from withdrawal and turned into use just as quickly as possible; for, as the muscle of man or horse can raise a few barrels of water from the well to supply stock or irrigate the garden patch, so can the power of the stream, turned into electricity, be used to raise millions of barrels of water to irrigate alfalfa farms or orchards. And this is now one of the most common uses of electric power in the West, and, in fact, in some of the eastern States where irrigation is found of value.

The waters that flow down our streams are only a small portion of the rain and snow which fall. There are streams that follow their courses underground just as clearly marked and as valuable, if once discovered, as the streams above ground; and to tap these is a part of making America. Cheap gasoline is doing it in some places; cheap coal in a very few; but cheaper electricity is doing it in a large way.

GETTING SUPPLIES OF NITROGEN

Then, too, there is that mystifying miracle of drawing nitrogen from the air for chemical use, which can be done only with great power, but is being done in Germany, Norway, Sweden, France, Switzerland, and elsewhere, by which an inexhaustible substitute for the almost exhausted nitrates of Chile has been found. This is already a great industry in Europe, and will by necessity become greater in the United States than elsewhere, because of our size and need and opportunity.

To increase the yield of our farms and to give us an independent and adequate supply of nitrogen for the explosives used in war, we must set water-wheels at work that will fix nitrogen in lime. And there are still more intimate uses for this power. In places in Montana it is so cheap that it operates the churn, the sewing-machine, and the vacuum cleaner, and supplies light to the house and fuel to the kitchen range. Indeed, for the possible uses of electricity there is no measure.

Accompanying the general development bill in its passage through the House was a measure intended to pro-

mote hydro-electric development on public lands, named after the chairman of the Public Lands Committee of the House, Mr. Ferris. This bill was called for by the fact that existing legislation permitted only a revocable permit to be granted for such use, and this was regarded by engineers and financiers as too tentative and hazardous a tenure where millions of money were needed for the installation of the necessary plant.

THE PEOPLE WANT THE LANDS USED

The Ferris bill meets this difficulty by proposing a lease of these lands for a definite term of 50 years. The objection is made that the lands should be given outright. To this there are several answers of substance: No enlightened government gives such a franchise. There is danger—very real danger, too—of a complete monopolization of such power sites if the lands go forever from the people.

The value of water power is not yet fully realized, and its full value cannot be known at this stage in our industrial life. The purpose of the government in transferring these lands is to secure their use, because it does not choose to use them itself; but the time may come when it may be most desirable to the full development of our life that they shall be operated by the Nation or the States or the municipalities in the States, and to transfer them forever would cast a burden upon the future which would be unforgivable, and is, moreover, unnecessary. The people desire these lands used, not held as a mere basis for speculation in stocks or bonds. Where there is need for such a plant, the lands should be available on most generous terms.

At the end of the fifty-year period, if the plant has been so managed as to best serve the country, there would be no reason why the holding company should not have a new lease.

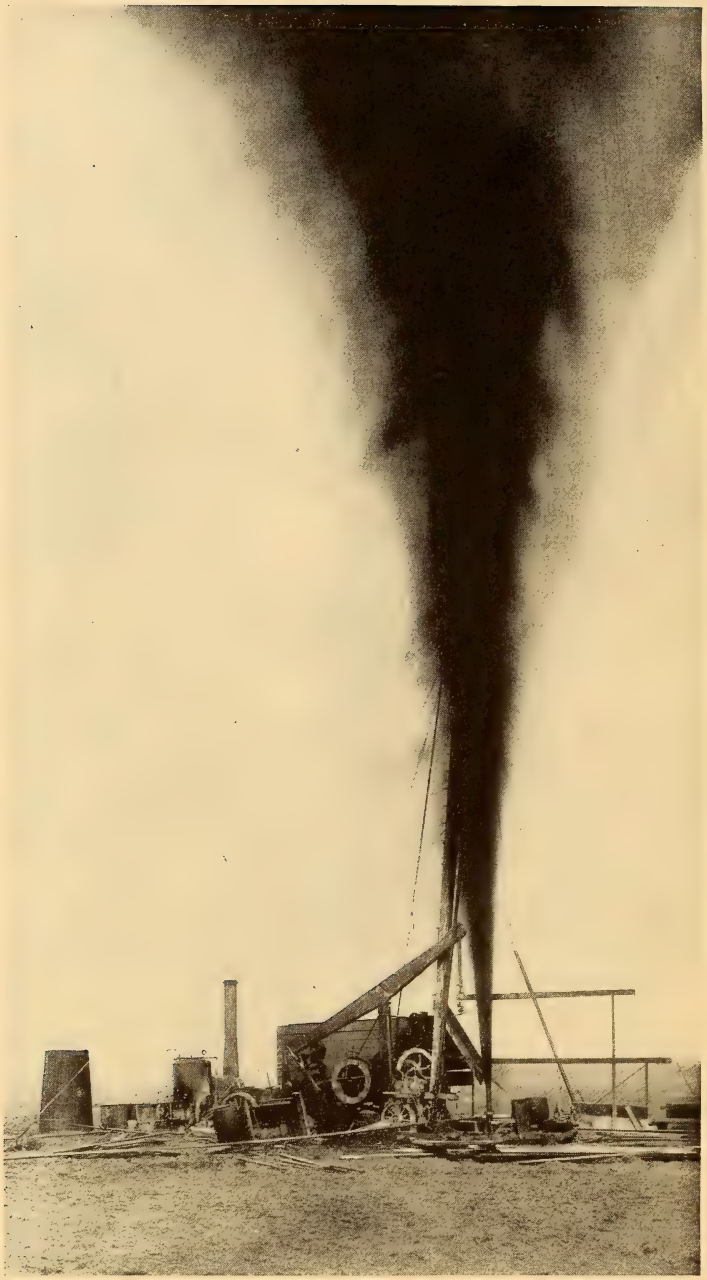
With the passage of these two measures (the general development bill for utilizing our oil, potash, etc., and the water-power bill) there will be no land or resource that will not be at the full service of the people; and yet the romantic enterprise of revealing America will not be done. To get from our resources their fullest use—this is our goal. And this is nothing less than a challenge to the capacity of a democracy.

There are many prosaic details involved in this quest. The mining men need a new set of mining laws, for instance. The old code is so elaborate and complicated that the best of brains cannot tell what the law is. The truth seems to be that between mining engineers and mining lawyers the rules of the game have been refined into obscurity. And if Congress were to say to the President that he might select three men familiar with mining laws and miners' difficulties to suggest a new mining code to Congress, it would, I believe, be giving in earnest a new freedom to the mining industry.

A LAND OF MYSTERIOUS CHARM

Then, too, there is the matter of the further development of Alaska. That land is a long way off. It would be too hazardous a thing to surrender these resources to local control or disposal, for those who have lived in any new country know how great the temptation is to grant away water front and power sites, forests, and other exceptional resources to those who come offering large sums for quick improvement. Yet this should not drive us into a policy that makes slow administration a necessity. The confusion in administrative action in Alaska is well known. I have tried to give it currency that it might hasten the establishment of some method of coördinated control of Alaskan affairs, primarily in the hands of a resident commission, but always in touch with and responsive to the wish of Congress and the President through one of the departments.

That land has a mysterious charm, a pull which affects all who see it, and those, too, who only know indirectly of its largeness, its grandeur, and its economic possibilities. This could not be better illustrated than by the number of applications for places which were received by the Alaskan Engineering Commission. When that body left for Alaska in the spring the number was over 38,000, and most of those who applied were not out



OPENING A GUSHER

"Petroleum is practically the one lubricant of the world today. No railroad wheel turns without its way being smoothed by it. Great turbines move on bearings that are smothered in it. From it we get the quick-exploding gas which is to the motor and airship what air is to the human body—therefore to waste it is a crime" (see text, page 597).

of work, but already held positions with railroads, in banks, on farms, or in some city shop. They wished a taste of the large life of this new land. There are many more of the same desire, some of whom will make Alaska richer by their presence and find happiness in searching out the land.

TAMING THE RIVERS FOR USE

No one can survey the physical condition of the United States without being impressed and almost overwhelmed with the magnitude of the work that must be done in keeping our rivers within bounds and putting them to use. It is the largest task that the government must undertake sooner or later, and the sooner, in my judgment, the better. This matter came immediately and most practically to my attention on a trip made in the late spring to the lower valley of the Colorado River. On the Arizona side of this river the government is reclaiming the desert. That lowland will grow almost anything, from dates to alfalfa. Its most helpful friend, and its unrelenting enemy, too, is the river itself, for without the river it would return to cactus and sage. Yet the river is so jealous of her freedom that she yearly attempts with violence, and by insidious methods as well, to reclaim for herself each foot of land that has by stealth been taken from her.

On the opposite side of the river, the California side, the river is held in by mountains, until it has reached the Mexican line. There, by a capricious turn, it deserts its old, accustomed channel and flows westward into what was once a lake, but is now little more than a morass, and so slowly finds its way to the Gulf of California.

Immediately north of this westward bend in the river is the Imperial Valley, which has lately been used by several novelists to illustrate the heroic struggle of man with nature; for this valley was once a sea itself, and has indeed left a sort of rudimentary sea in a lake known as the Salton Sea. The fruitful soil of this valley, hundreds of feet deep, is the silt of the Colorado, the deposited wash of a thousand miles of mountain channel.

Each June, when the snows of the Rockies melt, the Colorado, resenting the limitations which man has set up for it, presses with two strong shoulders against both sides of its prescribed banks, like Porthos under the slow caving of the earth. And as long as that flood comes the people on both sides must watch and work as the Hollanders have done.

CATCHING YOUNG WATERS

Now, far above this point of danger there are thousands of square miles of land that need but the water of the Colorado River to make them as fruitful as the lands of the San Joaquin or the Salt River Valley. We need to catch that water when it is young, soon after it has been born from the snows. There, in mountain valleys, it should be kept for a time and, as needed, led into the peaceful paths of usefulness. And on that problem the Reclamation Service is working. The difficulty is to find large reservoir areas.

This instance is cited to show how intimately the matter of flood control and of reclamation are bound together. The problem extends from sea to sea. When we come eastward, to the Missouri and the Mississippi, for example, we find that in their upper reaches the lands need the waters, while in their lower reaches the lands must be saved from the waters.

No one can take the yearly toll of lives lost and of property destroyed by the furious and unrestrained sweep of our rivers without realizing that the people of this country cannot regard themselves as owning this land, really possessing it, until they have brought these waters under subjection. And in doing this they will literally create new land by the millions of acres—lands that will support millions of people as against the thousands which live upon it today.

WHY SHOULD THE WHOLE BURDEN BE BORNE TODAY?

How these great works can be carried on calls for constructive thought, not merely on the engineering side, but more immediately upon the financial side, as to those ways and means by which the lands reclaimed shall be made to bear in some degree the burden of the expense. As to

Photo by National Geographic Society Alaska Expedition

IN THE ALASKAN GLACIER BELT

"That land has a mysterious charm, a pull which affects all who see it, and those, too, who only know indirectly of its largeness, its grandeur, and its economic possibilities. This could not be better illustrated than by the number of applications for places which were received by the Alaskan Engineering Commission. When that body left for Alaska in the spring the number was over 38,000, and most of those who applied were not out of work" (see page 599).

the funds which will be needed, they mount into such figures as to be staggering. And I can see no hope that this work will be adequately undertaken without the government advancing its credit and investing directly some of its own funds.

We are conducting this government from day to day out of current revenues. Only the richest of people could pursue such a policy. No private enterprise attempts it. No railroad system has been built that way. But few of the States now construct their highway systems out of the year's revenues. The permanent improvements which the whole people undertake are a legitimate charge against capital account, not against maintenance. A commission to devise the ways and means by which the States and private land owners and the National government can coöperate in paying for the work done seems to me a more needed body than one which will report upon engineering methods.

PLACES OF BEAUTY AS AN ASSET

In casting up the assets of the United States as a landed proprietor, I have made no mention of one of the most delightful of our national enterprises. To build a railroad, reclaim lands, give new impulse to enterprise, and offer new doors to ambitious capital—these are

phases of the ever-widening life and activity of this Nation. The United States does more; it furnishes playgrounds to the people which are, we may modestly state, without any rivals in the world. Just as the cities are seeing the wisdom and the necessity of open spaces for the children, so with a very large view the Nation has been saving from its domain the rarest places of grandeur and beauty for the enjoyment of the world.

It is the destiny of the national parks, if wisely controlled, to become the public laboratories of nature study for the Nation; and from them specimens may be distributed to the city and State preserves, as is now being done with the elk of the Yellowstone, which are too abundant, and may be later with the antelope.

If Congress will but make the funds available for the construction of roads over which automobiles may travel with safety (for all the parks are now open to motors) and for trails to hunt out the hidden places of beauty and dignity, we may expect that year by year these parks will become a more precious possession of the people, holding them to the further discovery of America and making them still prouder of its resources, esthetic as well as material.

OUR FOREMOST INDUSTRY

I turn now from young America, the land that is underdeveloped, to Young America, our twenty-two million school boys and girls; for these, after all, are our chief resource and our chief concern. Are we doing all possible to develop this resource?

If there is any one of our institutions in which the American people take undisguised pride and of which they feel justified in boasting, it is the public-school system, for this is "the greatest of American inventions" and the most successful social enterprise yet undertaken by any people. The United States maintains a Bureau of Education in this department, which, upon a small appropriation, collates as best it can the figures and facts which most inadequately tell the story of the growth and use of this most brilliantly conceived piece of governmental machinery.

The American people pay for the support of their schools almost as much as they do for the support of the entire Federal government; in round numbers, three-quarters of a billion dollars a year, which keeps an army of 600,000 teachers at work.

OUR LEAST PROGRESSIVE ACTIVITY

Education is indeed our foremost industry, from whatever point of view it may be regarded. Yet I am assured that it has made less progress than any of our other industries during the past 30 years.

With all the marvelous record of what the mind of a quick people may produce to make life happier and nature more serviceable, how little can be shown as our contribution to the methods of improving the mind and skill of the young! We have gone to Europe—to Italy, Switzerland, Germany, and Denmark chiefly—for the new methods with which we have experimented, and Japan has found a way to instruct through the eyes and hands that will make these very practical people still more distinguished.

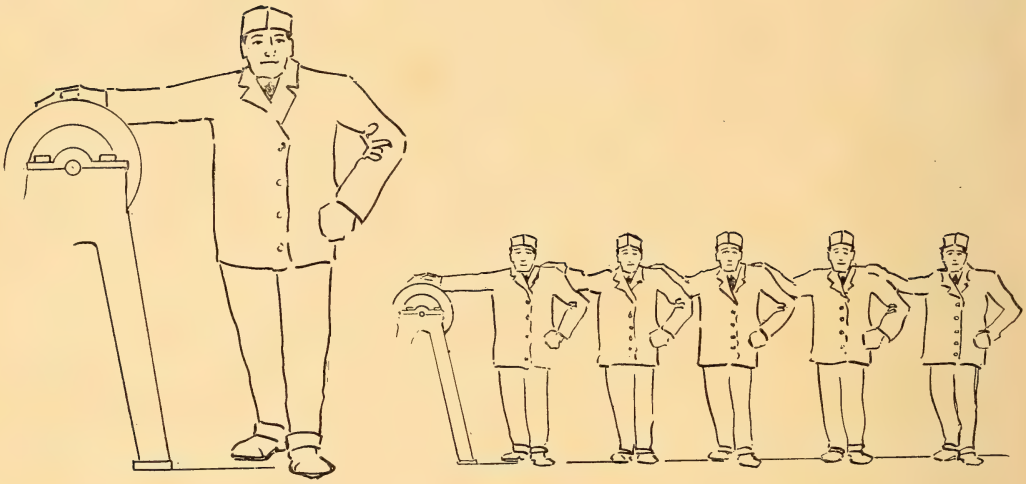
Yet here and there, under rare leadership, may be found in this country the most striking proofs of what can be done to tie our schools to our life. The hope is eventually to make the school what it should be, and easily may be made to be, the very heart of the community—social club and coöperative center as well as school.

There would seem to be nothing visionary in such a hope. To effect this evolution, there is needed primarily leadership, and this the government must give if it is to realize its desire for a people who are both skilled and happy.

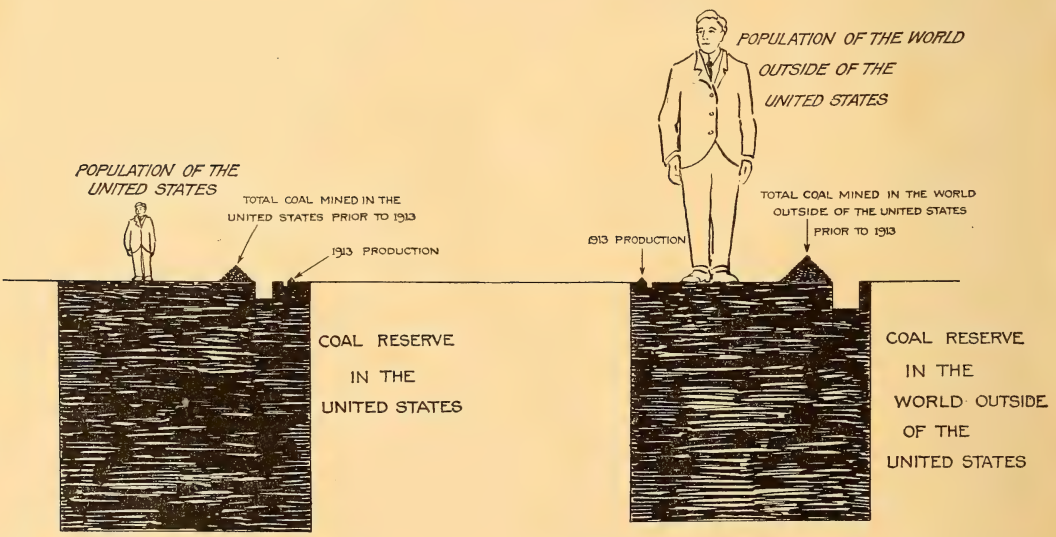
The spirit of our people is against a paternal government. We do not take with kindness to an authority that is mandatory. There is a sound belief that a people who make their own way are in the end riper and of stronger fiber than those who accept what is not the result of common determination.

A NATION "SHOWING HOW"

But this spirit of intense individualism does not make us independent of or indifferent to useful methods and helpful



One man with one metal cutting machine, equipped with tungsten "high-speed" steel tools, can now do as much work as could five men with five machines equipped with the carbon steel tools formerly used. These wonderful alloy steels, containing six or seven metals, have been largely, though not wholly, developed in the United States.


POPULATION OF THE UNITED STATES
TOTAL COAL MINED IN THE UNITED STATES PRIOR TO 1913
1913 PRODUCTION
COAL RESERVE IN THE UNITED STATES
POPULATION OF THE WORLD OUTSIDE OF THE UNITED STATES
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COAL RESERVE IN THE WORLD OUTSIDE OF THE UNITED STATES

COAL RESERVES AND PRODUCTION IN THE UNITED STATES COMPARED WITH THE REMAINDER OF THE WORLD

standards; and it is these that we can reveal. It is these that we should find and place in service, rather than force the disconnected schools of the land to feel their way out or "muddle through." We may not command, but we may "show how." This is democracy's substitute for absolutism in the effort to secure efficiency.

For such policy of helpfulness there is abundant precedent, not only in the action of Congress in making minor appropriations for the work of the Bureau of Education on precisely these lines, but in the activities of other departments.

The country is dotted with experimental farms, which prove soil values, and the farmer of today is learning from the government how great and all-embracing must be the knowledge necessary to the carrying on of his work; for he must know of chemistry, mechanics, markets and finance, transportation, and a world of things which his father or grandfather would have laughed at as the frills of a doctrinaire education, notwithstanding the early example of the wise and many-sided farmer who was the first President of this country.

As in the Bureau of Mines, we seek to save the lives of miners by educating them in the use of explosives and life-saving apparatus, and by instructing operators in safe methods of building their vast underground workshops, so I would erect the Bureau of Education into a Bureau of Educational Methods and Standards in which would be gathered the ripe fruit of all educational experiments upon which the schools of the country could draw. This is a wide country, and there is need for a national clearing-house where can be centered and exchanged the results of the most remote experiments.

NO MORE MODERN THAN A WOODEN PLOW

There is no disguising the fact that we have a most difficult problem in the United States—and I cannot believe it is ours alone—in the rural community. A majority of our school children are in rural schools. The query arises: Are our rural schools doing their part in making life in the country desirable? An ambitious people will go where education can be had for their children. There is no sense in talking of the charms of country life and the independence and dignity of producing from the soil if the school at command is no more modern than a wooden plow.

The old-fashioned one-room schoolhouse which holds 40 or 50 ungraded pupils, having but a single teacher, who knows nothing but books, is not a modern institution, though great men have issued from its door. It may be all that the county can afford where many schools are maintained, but it is not all that the county can afford if schools are grouped and grades instituted.

The richest State in the Union has over 4,000 schools of this character, wherein the teachers are paid less than competent farm hands; and this brings to mind the correlative thought that one needed reform in the school system is in the elevation of teaching into a real profession, as in older countries. As it is now, a teacher is almost without status in our society.

How can the schools of a county be so coördinated and combined as to make them efficient tools? What should be the standard for a teacher's qualifications? How may children be brought to and taken from the school to distant homes at the least expense? To what extent should the teaching be out-of-doors and the "examples" those of real life?

How can the boy learn that there is adventure in farm life as well as in the city?—for adventure he will have. To what uses may the school building be put as a community center for the neighborhood dance, lecture, or moving-picture show, or, perhaps, as the home of a co-operative buying or marketing organization?

These are but a few of the questions which many men have tried to answer, and there have been some successful experiments made and right answers given.

A RURAL REVOLUTION

But it is as hopeless a task for a local school board to find these answers as for a lawyer to know the decisions of all the courts. The teachers, the superintendents, and the school boards need leadership; they need an authoritative statement of conclusions by the wisest and most practical men in the land; they need

to be shown the better way. And with even as little as a hundred thousand dollars a year for two or three years we could, I believe, conduct a campaign for a new kind of rural school that would work little less than a revolution in rural life.

Our aim would be to identify the school with the farm and the village and develop a new respect in fathers and mothers for the school as a practical and not a mere scholastic institution. The problem is only one of popularization. The experimental work has been done. We know where the best seed is. The need is immediate, and surely it would be a shame to let a generation waste itself while the idea slowly creeps on all fours through a country that has invented wireless telephony.

THE TEST OF A DEMOCRACY

There is an evolution in a new nation's life quite as interesting as that in the life of a man. We pass through stages of development from the simple and earlier period, when food is the one thing desired, into the more elaborated and complex stages, where first we begin to deal with the easily handled things and later reach the point where mind has a controlling part in all that is done.

The pioneer builds his cabin and turns his cattle to graze upon the unfenced wilderness. He takes his water from the stream and makes his gun serve him with food and give him protection. It is not many years, however, before he has passed from herdsman to farmer, when soil must be plowed and seed sown. At first the one-horse plow will do and any seed. But life grows more intense—society has gathered around, new demands are created—machinery must be used, seed must be selected, soil fertilized, credit obtained, markets sought, and the life of the simple herdsman has become complicated and broad. The gay recklessness of other days gives way to constant thought.

So has it been with this country. For a long time we lived off the country's obvious supplies. Later we were producers of raw materials—grains and minerals, lumber and cotton. When manufacturing began it was of the larger, coarser things, which perhaps in their turn went abroad for higher fabricating. Now, however, we have come into the full tide of modern life, when we seek for greater and more varied industries, wider markets, more economical methods of production and exchange. And in such a new time direction is needed, mutual and coördinated effort must be set up, and the more elaborate machinery of organization put into service. Thought becomes the basis of the new life—hard, close, insistent, constructive thought, illuminated by knowledge and made practical by imagination.

COÖRDINATION NEEDED

I have reviewed some of the activities of this department that they may suggest how adequate to the task of efficient national development a democracy, even one so young, may be made to be. It has a foundation in the spirit and self-confidence of its people which no other government can have. There is needed but the crystallizing touch of coördinated action to make its success complete. To develop methods by which the energies of many individuals shall be brought to work together is the need; and as the method of doing this politically has been found in this Republic, so we may feel assured that economically and socially we shall not fail.

An intense nationalization has been the marking note of the past year. Each American has realized with keener consciousness the meaning of this land to him, and has sought for a larger view of it in its many aspects and, if possible, to gain a glimpse at its future. To each has come his dream. We know now that there is more to national feeling than pride in the possession of a land that is rare and valuable or the splendid memory of a history of struggle for those things of the spirit which men call principles. The highest sense of nationality comes with a sense of purpose—a sense of common purpose—for the United States is not yet ours in the proudest sense, and cannot be until we are doing all that can be done to give to all its people and to the world the full expression of its highest intelligence applied alike to its resources and to the life of the people.

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